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MURCHÉ'S DOMESTIC SCIENCE READERS

BOOK VII

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DOMESTIC SCIENCE
READERS

BY

VINCENT T. MURCHÉ

AUTHOR OF 'OBJECT LESSONS IN ELEMENTARY SCIENCE,' 'OBJECT LESSONS IN DOMESTIC ECONOMY,' 'OBJECT LESSONS FOR INFANTS,' 'SCIENCE READERS'

WITH PREFACE BY

MRS. E. M. BURGWIN

INSTRUCTRESS UNDER THE LONDON SCHOOL BOARD
EX-MEMBER OF THE N.U.T. EXECUTIVE

BOOK VII

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DOMESTIC SCIENCE READERS

ADAPTED TO MEET THE REQUIREMENTS OF
THE EDUCATION DEPARTMENT

IN THE

CLASS SUBJECT OF DOMESTIC ECONOMY

AS LAID DOWN IN

THE CODE FOR 1896

BOOK I. BOOK II.	STANDARDS I. AND II.—CODE 1896. Thirty object lessons on materials used for food—*e.g.* Flour, Meat, Vegetables, Tea, Coffee, Milk, Fruits, Salt.
BOOK III.	STANDARD III.—CODE 1896. Chief materials used in clothing and washing—*e.g.* Silk, Linen, Wool, Cotton, Fur, Leather, Washing materials.
BOOK IV.	STANDARD IV.—CODE 1896. Food: its composition. Clothing and Washing. **Note.—The Chemistry of Food should not form part of a scheme for Standard IV.**
BOOK V.	STANDARD V.—CODE 1896. Food and beverages: their properties and nutritive value and functions. The skin and personal cleanliness. *Note.*—The Chemistry of Food is dealt with in this book.
BOOK VI.	STANDARD VI.—CODE 1896. Food: its preparation and culinary treatment generally. The Dwelling: Warming, Ventilation, Cleaning.
BOOK VII.	STANDARD VII. Food: simple dishes. Rules for health. Common ailments, and their remedies. Management of a sick-room.

PREFACE

In this book, the last of the series, the one aim has been to gather up the threads of all the earlier teaching, and weave from them a volume of sound, reliable advice, which girls can put into practice in their everyday lives.

Old friends have been re-introduced, and the narrative form has again been adopted for the purpose of sustaining the interest of the young reader in what might otherwise become a dry, wearisome subject; and it is with the same view that the book has been profusely illustrated.

The lessons dealing with Temperance, designed as they are to foster a wholesome feeling of hate and disgust for drunkenness, are based upon the principle of *using but not abusing God's gifts;* and other forms of intemperance, besides that of alcoholic drinking, are dealt with as occasion arises.

The Registrar-General's latest returns, showing the fearful rate of infant mortality, are used as the vehicle for conveying some sound scientific, or at least common-sense information, on the treatment of the little ones.

In dealing with Common Ailments the principle *of prevention rather than cure* has been the key-note.

The reader is first shown how to avoid them, to a large extent, by careful, consistent, common-sense living, and afterwards some rules for their proper treatment are given.

The accidents dealt with here are merely those of common everyday occurrence; it seems an absurdity to fill a book of this character with directions for treating a broken limb, or any other serious injury, which absolutely calls for the highest surgical skill. The object of this section of the book is to point out what ought to be done in any emergency, so as to prevent a wrong step being taken before the arrival of the doctor.

The chapter on the sick-room and its management insists on the fact that the nurse is only second in command. She is the doctor's lieutenant, his second self; she must obey all his instructions implicitly in the interests of her patient.

The author again begs to acknowledge his indebtedness to the Ladies' Sanitary Association of Berner's Street W., and to Miss C. E. Guthrie Wright, the Hon. Secretary of the Edinburgh School of Cookery and Domestic Economy, for valuable assistance.

PREFACE BY MRS. BURGWIN

THIS book completes the series of Domestic Science Readers, which have, by a studied continuity of lessons, met the requirements of the Education Department in the class subject of Domestic Economy.

The author has striven, and I think with success, to make the reading simple and the subject matter interesting. The eyes of the girls have been opened, I trust, to see that there is in the ordinary daily work of the humblest home nothing "degrading" or "menial" —words so often used to discourage them from entering domestic service, or intelligently assisting in the work of their own homes.

A girl who reads this book with understanding will be a valuable help in the home "in Sickness and in Health"; and if she can practically complete her training in a good Housewifery Class, she will certainly become a useful woman.

The chapters on Food show clearly how greatly health depends upon its suitability, and that health and happiness can only be secured by the knowledge of, and attention to, the Laws of Nature.

E. M. BURGWIN.

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BOOK VII

PART I.—THE LAWS OF HEALTH

Lesson I

A Meeting of Old Friends

Look at the faces in the picture. Do you recognise any of them? They are old friends of ours, whom we have known for a long time. That womanly-looking girl on the left is Norah. She stands beside her mother, and her friend and teacher, Miss Brown, is seated on a chair close by. The two girls behind her chair are Maggie and Nellie, like their cousin, grown almost out of knowledge since we first saw them with their dolls years ago.

They are all engaged in a very animated conversation, for the object of Miss Brown's visit is to make arrangements for her three young friends to attend a course of Health Lectures to be given by Dr. Thornhill at the Institute, and Mrs. Hunter herself has just announced her intention of accompanying them—at least as often as she is able.

She, kind soul, has been devoting considerable time of late in trying to ameliorate the lot of some of the poor families in the lower quarter of the town; and it has often made her heart bleed to see, in some of the homes, the amount of sickness and misery, which might be easily traceable to the mother's absolute ignorance of the laws of health.

"I shall be glad to go with you to the lectures," she is saying, "for this is a subject in which I am deeply interested—a subject with which we, as women, cannot be too well acquainted. I have long since come to the conclusion that disease and suffering are more often due to ignorant violation of the laws of health, than to want of food and other necessaries of life.

"Our schemes for hand-to-mouth relief are very good in their way, but they leave off too soon. It is clear to me that a widespread knowledge of the laws of health is quite as essential to the physical elevation of the poor, as the charity dole which saves them from present starvation.

"My mother's heart," she continues, "goes out to the poor woman who is sobbing and wailing over her lost darling, although perhaps I know that the little one has been sacrificed on the altar of ignorance. Had she understood and followed Nature's laws her baby would, in all probability, have been in her loving arms now, healthy and strong.

"Of course, one cannot tell the poor suffering creature all this at the time. She would doubtless have given her own life to save her baby. Want of knowledge, not want of love, was her fault. Still, I always take an early opportunity in such cases, when the bitterness of the grief is over, of inducing her to listen to a few suggestions for her future guidance, for the benefit of those that are left.

"But even this is often a difficult matter, for however ignorant a woman may be, she thinks she knows best how to manage her own children. She acts, she would say, on her womanly instincts; they are quite sufficient to teach a mother all she wants to know. Poor creature! her heart is in the right place; she means well, but how can even her motherly instincts avail her, if they violate every known law of health?

"The wild creatures of the forest act by instinct, but their instinct obeys, instead of violating Nature's laws. They do not suffer and perish on the very threshold of life, as such vast numbers of the offspring of humanity do. Who ever saw the cubs of the wolf, the lion, or the bear moaning in sickness and agony, or the young eaglets lying dead in the nest? These creatures are, from the first, full of health and vigour, and, apart from accidents, remain healthy and vigorous throughout their allotted term of life.

"Think, on the other hand, what must be the infant mortality amongst us. Thirty out of every hundred of our little ones are cut down, from one cause or another, before they reach their fifth birthday: and our own everyday experience tells us that large numbers of the rest grow up weak and sickly. Depend upon it, with proper management, such things ought not to be.

"But there is a lower grade, far beyond the well-[illegible]ing but ignorant mothers, and they too must be reached, before this terrible rate of infant mortality can be stopped or even stemmed. Only those who, like myself, have visited the poor in their own homes, can form any idea of the fearful way in which their little ones, or some at least of them, are mismanaged.

"It is no uncommon thing in certain quarters to see the baby of only a few months fed with scraps of its mother's food, be it red herring, cheese, cucumber, or what not. Sometimes it is even made to share its mother's pernicious dram, and when, as the result of all this ignorance and wrong treatment, the little sufferer is fretful, and cries, it is quieted down with a dose of laudanum, which deadens all sensibility, and not unfrequently (if the dose is larger than usual) wraps it in a sleep from which it will never wake again."

"I have exerted all the influence I possess," said Miss Brown, "to interest every class of the community in these lectures, and the doctor is now sure of a large and attentive audience. I want, as the result of them, to see everybody dissatisfied with the present state of things—the very poor dissatisfied with their filth, squalor, and bad management; the careless dissatisfied with their waste and intemperance; the well-to-do dissatisfied at having these plague-spots in their midst; and even the landlords of the wretched hovels and tenements, in which the poorest section of the community are herded together, ashamed of the part they take in perpetuating these social evils.

"But, after all, it is to the women of each class that we must appeal, for this is essentially their work. The men have their own spheres of work outside, but the women are absolute mistresses in their homes—*they can make them* what they please. The woman herself must learn, in her capacity of housewife and mother, to apply the laws of health in her own home. When this is accomplished, we may confidently look forward to an improvement in the physical condition of all. Instead of the low, stunted, puny weaklings we now meet with, especially in poor families, we shall in time be the means of raising up a robust, healthy race of men and women."

Lesson II

THE DOCTOR BEGINS

The appointed day came, and sure enough Miss Brown's prognostication proved correct, for the doctor had a large and attentive audience.

"I am glad to see such a full and representative gathering," he began, "and I am especially glad to see so many wives and mothers present, because, after all, my observations will concern you much more closely than your husbands. They are the bread-winners, it is true, but you are the guardians of the health of the entire family.

"What a strange thing it is that so few people seem to set a proper value on health, and yet it is the greatest blessing under the sun. I suppose it is that they value it in proportion to the price they pay for it; it costs them nothing, and they value it accordingly. They never know the true worth of health till they have squandered it, and it slips away from them through their own neglect. Then, indeed, such people would *gladly buy back* at any price the health they once *valued so lightly.*

"The object of these discourses will be to put before you, in its true light, the inestimable blessing of sound robust health, and to prove to you that it is the duty of every one of us, children as well as adults, to do all in our power to preserve the health of the body.

"Think of the advantages which healthy people have over those who are unhealthy. They are strong and vigorous, ready at all times to take their full share of hard work, and equally ready to throw themselves heartily into everything that means the real enjoyment of life. Working or playing their lives are bright, happy, and cheerful, because they are full of the glow of health.

"The poor, weakly, suffering one, on the other hand, who has been robbed of health, feels that *everything is a trouble.* Racked with pain and torture, the sickly body re-acts upon the mind, and life itself becomes a burden. With all brightness gone, with nothing but a life of suffering, and an early grave as the inevitable goal ahead, what wonder is there if the temper becomes soured, peevish, gloomy, and irritable. Ask some such poor brother or sister to fix a value on health, and then you will get it measured at its true worth.

“Then, again, if you compare the hollow sunken eyes and the pale emaciated face of the one with the ruddy, healthy cheeks and bright eyes of the other, you will see that health is the best of all aids for the preservation of our good looks, and you know we all like to keep *them* as long as we can,” he added with a pleasant smile.

“We have a fine handsome clock on the wall opposite, you see,” he continued. “He looks well enough in the face, for, unlike us, his face is not a telltale of his condition; and the people here evidently like to see him look smart, for they certainly keep his face well polished up. Yet it only took a single glance to show me that all was not so well with him as it might be, in spite of his bright outside appearance.

“When I came into the hall this evening, I found him ticking away as if nothing was the matter, but unfortunately his hands told a different story, for the were pointing to three o'clock instead of half-past seve —the actual time.

“I called the attention of the hall-keeper to th and he told me that the clock has given him gr trouble, and after all is never to be depended u week by week, he winds it up and se and sure enough before the day is over, it has either lagged behind, or galloped on too fast, so that it is useless as a time-keeper.

"He was so full of complaint about the clock that I asked him whether it had always acted in this way, and I learned that it was a very good clock at first, that it had only taken to these uncertain fits the last month or two.

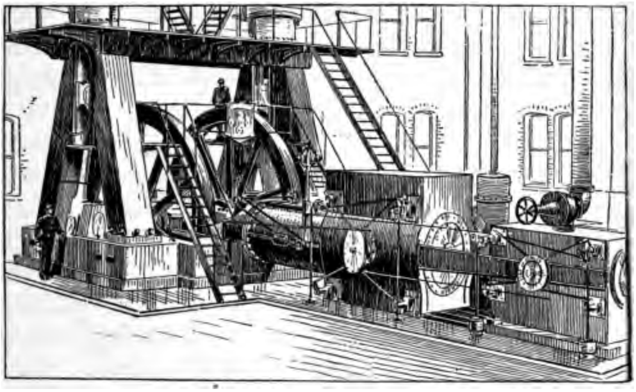
"Curious to find out the meaning of this I opened the door of the case, and the first thing to catch my eye was a quantity of loose fluff and hair, and dust, matted together and collected round the works inside. I pulled some of it out with the point of my penknife and showed it to the man.

"'Here is something,' I said, 'which the clockmaker did not put into the clock. Before being too hasty to blame the clock and its maker, think whose fault it is that the inside is in this state. Look at the wheels and pinions, and all the rest of this delicate machinery, and you will find them choked up with dirt in every crevice and corner. Poor fellow, it would be a wonder if he did work well in such a state as this.

"'The fact is you had a first-rate clock put into your keeping by the maker, but you have not known how to use it fairly. It will never be of any use as it is. It must be taken in hand; its works must be thoroughly cleaned and oiled, and then when it comes back to you again in good working order, you must see that you take better care of it in the future.'

"It occurred to me while speaking to the man, that this poor neglected clock would serve as a most apt illustration of the very subject, we are met here to *discuss this evening.* Each of you has been entrusted with a beautiful, elaborate, yet withal a most delicately-made piece of machinery—the body in which YOU live. The keeper in charge of it is the mind, whose duty it is to take every possible care to prevent this wonderful machine from getting out of order.

"If the keeper be negligent in duty, either through ignorance or carelessness, there can be but one result—the whole of the machinery will be thrown out of gear, and unfitted to perform its proper work. Remember, comfort and ease in the body are very much like the regular, steady movements in the clock. They are signs, in both cases, that the machinery is in good working order. On the other hand, discomfort and disease in the body, like the jerky, uncertain movements in the clock, are equally sure signs that there is something wrong with the machinery, which requires to be set right at once.



"*Now let me* give you another illustration of a *different kind.* A few weeks ago I had the good ortune to be shown over an immense factory in one f our great manufacturing towns. In such places of ourse the machinery is always the great attraction or a visitor—it certainly was for me. As I stood nd watched those powerful engines at their work, ike mighty giants swinging their massive arms up nd down, and rolling huge wheels and ponderous hafts round and round with resistless force, never making mistakes, and rarely getting out of order, I turned from them and looked with wonder at the attendant in charge, who guides and controls it all, and it seemed almost impossible.

"But what an attendant he is. What watchful care he bestows on these mighty giants of iron, steel, and brass. Why, without him, powerful and clever as they are, they would quickly get out of order, and reak down in their work."

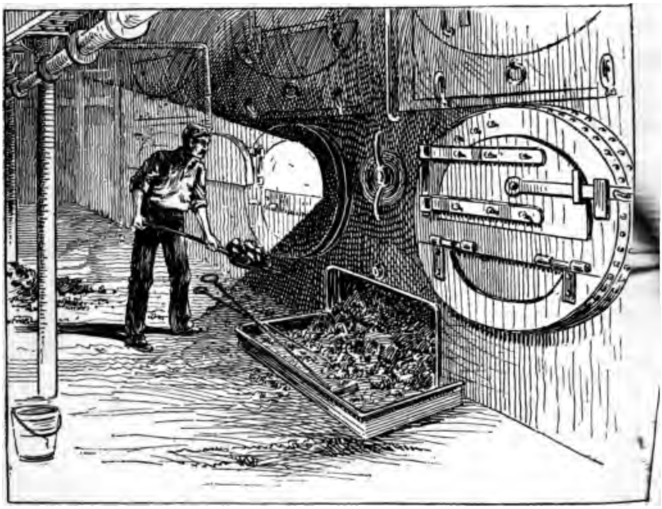
Lesson III

THE LAWS OF HEALTH

"Let us watch this man," continued the doctor, and we shall learn what he has to do to keep his ngine and the rest of the machinery in good working rder.

"His first care is to see that the furnace is fed om time to time with fuel. He knows exactly hat is wanted, and how much is wanted, and he eds it accordingly. If we saw him shovelling in et sand, *instead of* good coal and coke, we should *once vote him a fit* candidate for a lunatic asylum.

If we found him choking the furnace up with too much, or starving it with too little, we should say: 'This man does not understand his business; he is not a fit man to be entrusted with the engine. He will ruin it before long.' But why should we say this? Because we know that the fire will only burn under certain conditions. Those conditions become a sort of law to guide the man in his work; and if that law is violated, nothing but disaster can come.



"His next care is to keep the gratings of his furnace clear, and free from clinkers and ashes, so as to allow a constant draught of air to enter, because he knows that without plenty of air the fuel in the furnace will not burn. This then becomes another *law for his guidance* in keeping the engine in good *working order.*

"How carefully, too, he watches over the great engine itself, polishing up its rods and wheels, and oiling them from time to time, as the work goes on. How diligently he wipes away even the smallest particle of grit or dust from those oiled, polished surfaces, because he knows that all must go smoothly—that even a little bit of sand or grit is liable to snap one of those cogs as it flies round, and so disable his powerful giant altogether. Here you see he has another law for his guidance. He must keep them all before him, and act upon them, if he is to get effective work out of his engine.

"Now let us see what all this has to do with the subject before us—the preservation of our bodily health. Our body, as we have already said, is a beautiful machine, you and I are the man in charge. The working of this machine, like the working of the steam-engine, is dependent upon certain unalterable laws, which cannot be violated without the most disastrous consequences. These we may call the Laws of Health. Let us find out what they are.

"I daresay, if I were to ask any one of you to name the thing we need most to keep us alive and healthy, you would say food and drink. Well, food and drink are certainly very necessary, for like the engine we must be fed—we could not live without our food. But I think I shall be able to prove to you that food, after all, is not the most essential thing.

"Picture to yourselves some person—a strong man if you like—supplied with abundance of food and drink for the day, but compelled to spend that day shut up close *in a small glass case.* What would *happen? You know* that the food and drink would be of very little use to him. He would not be able to breathe, shut up in that close case; the food would not keep him alive; he would die. In fact he would die long before the day was out; the end would come in a very few minutes, if the glass case was small.

"You had your meal before you came here; you will do very well, so far as food is concerned, till you return home; but you have been constantly breathing thirteen or fourteen times every minute ever since you came into the room. Nay, we have all been breathing, from the moment of our birth, night and day, sleeping and waking, and we shall continue to breathe as long as we live. We could not live for even two or three minutes without air. So then I think you will agree with me that, important as food and drink are, air is even more important still.

"Let us now think of the body, duly supplied with food and air. It was the draught of air, you remember, which caused the fuel in the furnace to burn; it is the air we breathe in, which causes our internal fires to burn, and so produces heat to warm our bodies. This bodily heat must not be lost. We could not possibly live if this heat were allowed to pass away. Hence it is that proper clothing becomes the next thing necessary to health.

"I will now appeal to those of you who are mothers," the doctor continued. "There is no duty which a mother is more careful to perform than that of regularly washing her young baby. Even the most careless and dirty woman knows that this is a duty which must not be neglected. But why does she *discontinue the bath* when the little one is able to toddle *bout? Children* cannot thrive if they are dirty, any more than young babies; neither can grown-up people. Cleanliness is undoubtedly the next thing necessary to health.

"There is another thing which not only babies but we ourselves dearly love, and that is the light. No one can thrive in the dark. Even a sturdy green plant will turn white and sickly-looking if it is shut up in a dark place. Light is very necessary to health.

"Let us think once more of the baby. What is the first thing it does, as soon as it is strong enough to wriggle down from its mother's lap? It crawls and kicks about on the floor; it is never still for a minute, and the healthier it is, the more active it is, till at last it gets strong enough to stand on its legs, and run about. This is all quite natural; the little one must have exercise, and it must continue to have it, not only throughout childhood, but in adult age as well, if the body is to be healthy and strong.

"Lastly, we all know that after exercise of any kind, whether it be for work or amusement, the body gets tired, and requires a certain period of rest. The rest restores the bodily faculties; without it we could not live. Rest, then, is another of the necessaries of health.

"I have in this way enumerated one by one the laws or rules of health. Let us see what they are.

"1. We must have a sufficient amount of suitable food.

"2. We must constantly, night and day, have abundance of fresh air to breathe.

"3. We must have suitable clothing to maintain the *bodily heat.*

"4. We must keep our bodies, our clothing, and our houses clean.

"5. We must have as much sunlight as possible.

"6. We must exercise every part of the body.

"7. We must take a sufficient amount of rest at regular intervals.

"Let me impress upon you in conclusion that these laws of health are binding upon us one and all. Those who are strong and healthy now cannot tamper with them without ruining their constitution. Unfortunately, however, we are not all blessed with strong constitutions to begin with; many people are naturally delicate and weak, although not positively in ill-health. Yet even these, by carefully observing the laws of health, may easily keep out of the doctor's hands, and save themselves from a life of suffering and unhappiness."

Rule I—Food must be sufficient and suitable

Lesson IV

FOOD

"I was sorry you could not go with us this evening, Nellie," said Norah. "The lecture was about food, and although the doctor went over most of the ground which Miss Brown had already made familiar to us, he had much to say that was new and interesting. Shall I tell you something about it? You wish I would; well, I will try. The doctor began by reminding us of his engine once more. 'That great iron nt,' he said, 'gets all his strength out of his food.

He eats black coal by the shovelful, and from it he gets his power. Stop his food, and he will refuse to do another stroke of work; but feed the great fellow well, and you will hear him roar hoarsely with satisfaction, as he swallows each mouthful, while (as if to show his gratitude) he swings his mighty arms cheerfully to the task he has to perform.' I thought this was so amusing, that I took it down in my notebook as the doctor spoke. He has such a pleasant way of putting everything.

"Well, he then went on to explain that the strength, which enables us to move about and work, also comes from the food which we eat; but he showed us too, that our body is a much more wonderful machine after all than the steam-engine. That wears away in time with its work, and becomes merely a mass of old iron. Our bodies wear away too, but as they wear away, they are able to repair themselves from time to time. The food which we eat, besides giving us strength, provides the material for this repairing work.

"He next began to talk to us about the blood, and the way it is carried into all parts of the body through pipes called blood-vessels. Here, of course, we girls were quite at home, thanks to Miss Brown's lessons; and we easily followed him in his description of the manner in which the solid beef and bread and other food is washed along those tubes, some of which, he says, are as much finer than hairs as a hair is finer than a drain-pipe three feet in circumference.

"This led him to talk about the work of digestion, and here again he was on familiar ground when he began to describe the mill-stones for grinding the food, the saliva for moistening it and dissolving its starchy matters, and the gastric juice and bile for completing the work in the stomach and intestines. He ended up by saying that the whole purpose of digestion is to change the food into actual blood, fine enough and smooth enough to pass along those delicate hair-like pipes into every part of the body. 'Bear in mind,' he said, '*it is not food in the stomach,* but FOOD IN THE BLOOD, which is able to nourish the body and give it strength.'

"The great object of cooking the food is to help in this work of digestion. The doctor says cooking is really a sort of artificial first-step in digestion. It begins the work by making the food tender, so that it may be more easily broken up and dissolved in the stomach.

"When he had reached this point in his lecture, the doctor handed round to each of us a slip of paper, which he had had printed for the purpose. 'These,' he said, 'contain a few golden rules to guide you in your eating. Let us commence with the first.' He took them one by one and explained them as he went on. I cannot remember now all he said about them, but I will read to you what he has had printed on these slips.

1. "*You have a mill: use it well.*—Depend upon it, your double row of strong teeth, firmly set in both jaws, was not given you without a good purpose. Those teeth were meant for work—hard work,—the work of thoroughly grinding up the food. If you will only give them time to do their work properly, not only will the food be ground up small, but the saliva will have a chance of mixing with every particle of it, till it is reduced to a sort of pulp. Then, and not till then, is it in a fit condition to be swallowed.

"If you bolt your food in lumps without letting the mill do its work, the stomach, however strong it may be, will find those lumps altogether unmanageable. Its juice will not be able to get to them, to break them up and dissolve them, and at last, after suffering griping pains and all sorts of annoyances, it will cast them out in an undigested state. Food bolted in this way gives the stomach unnecessary, and above all, profitless work. It provides no nourishment whatever, because although it is put into the stomach, it can never get into the blood.

2. "*Always eat enough.*—Let me say, to begin with, that *enough* does not mean *more than enough.* The body requires a certain amount of nourishment from time to time, or it will lose in weight and strength; and it is well known that young people usually eat more than their elders, because they require material for growth as well as for repairing the waste.

"You have, no doubt, often heard that '*enough is as good as a feast*'; but I want to impress upon you that '*enough is far better than a feast,*' if by '*a feast*' we mean '*more than enough.*' If too much food be taken, not only are the organs of digestion overworked, but the superfluous food is stored up in the body, and gives rise to rheumatism, gout, fever, or inflammation, and the doctor must be called in. Remember, there is always more danger in over-eating than in not eating enough.

"But perhaps you will say 'How shall I know when I have eaten enough.' This is a question which each person must settle for himself, because some require more food than others. Be sure, however, you *have had enough* when your appetite is satisfied. That is the golden rule. Think with what keen relish you sit down to your food when you are hungry, and how eagerly you attack what is placed before you. But even while you are eating, the relish grows less and less, and at last those very things which had tasted so delicious when you began your meal, now give you no pleasure in eating. This is the time to say '*I have had enough.*' Stop eating then, and let nothing induce you to swallow another mouthful till the appetite and relish come back.

" If, instead of this, you go on eating after your natural appetite is satisfied, the overloaded stomach will rebel against your tyranny. It will either return the whole of the food back as it received it, or sullenly refuse to do its proper work, so that in either case the blood (and, of course, the body itself) receives no nourishment. Both are starved, although the stomach has been overgorged with food.

3. " *The plainest, simplest food is best.*—By plain, simple food I do not mean coarse, nasty food. The mother's duty is to see that all the meals are made as delicious and appetising as her means will allow. What I do mean is to warn you against highly-flavoured dishes of dainties and tempting things, which excite a false and artificial appetite after the natural one has been satisfied. These things not only lead people to overload their stomach, but actually take away the appetite for other food.

" Children, in a similar way, who are always eating sweetmeats, lose their natural appetite for the good wholesome nourishing meal when it comes.

4. " *Never eat between meals.*—Regularity in feeding is very conducive to health. Three meals a day for

adults, and four for children, are found to be the best possible arrangement. This not only gives the stomach time to do its work properly, but also allows it a period for rest when the work is over. Regularity also means that the meals should come as nearly as possible at the same time each day, and *there should be no eating between the meals.*"

Rule I.—Food must be sufficient and suitable

Lesson V

TEMPERANCE AND HEALTH

"Our lecture this evening is to be on temperance," began the doctor, when he next met his friends at the hall, "and I want you at the very commencement to clearly understand what this word temperance means. I intend to give it a very much broader meaning than is usually applied to it. Temperance means moderation. A temperate person uses God's gifts, one and all, wisely and well. He uses them, but does not abuse them.

"Let us think for one moment about our discourse on Food. What would you say about a person who gorges and overloads his stomach through greedy gluttony, and lays up for himself thereby a legacy of disease and suffering ? One could scarcely say that such a person is temperate, and yet many of the so-called advocates of temperance never give this side of the question a single *thought.*

"I have myself seen people who are positively

hoggish and disgusting in their intemperance in eating, but be sure their sin will find them out sooner or later by the ruin of their health. This is why I determined to begin my temperance discourse this evening by once again alluding to the evils of over-eating.

"Remember, then, that true temperance refers to eating as well as to drinking. The temperate man uses the food placed before him—he eats *enough;* the intemperate man greedily overloads his stomach with *more than enough,* and pays for it afterwards.

"Now that we have made this clear, let us pass on to consider the question of drink. You have seen what an important part water plays in the economy of the body. Every organ in the body depends upon water for the due performance of its functions. Indeed, by far the greater part of the body itself is nothing but water. What will you think when I tell you that a man weighing 150 pounds is far from being as solid as he looks—that no less than 113 of those pounds are water, just like this in the tumbler before me? Yet, it is so.

"You know, too, that the body is constantly losing some of its water, through the lungs, the skin, and the kidneys. If this water were drained off through these channels, and there was no fresh supply to take its place, the blood in the vessels all over the body would soon become so thick that it would no longer flow, for the blood itself, of course, consists largely of water.

"It is this very thickening of the blood, through the draining away of its water, and its consequent sluggish movement through the vessels, that gives rise to the unpleasant feeling of thirst. We instinctively take a drink of some sort, and, like magic almost, the unpleasant feeling disappears. Let us see what happens.

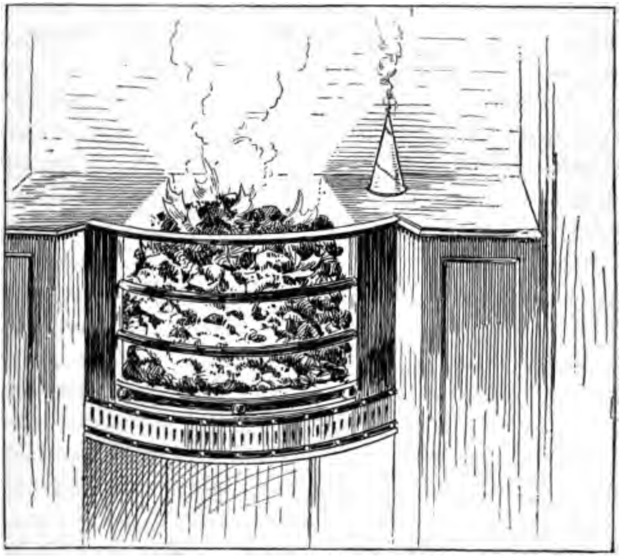
"The drink which we take to quench our thirst passes directly into the stomach, and is at once greedily sucked up by the thickened blood in the little vessels which crowd its inner lining. This blood, now made thin enough to flow once more in its natural way, rushes onward and, in less time than it takes to tell, finds its way into heart, brain, liver—every corner of the body.

"My object in telling you this is to show you how easily good drink can carry health and vigour to these delicate organs, and how equally easy it is for bad drink to convey to them mischief and disease. Now let us see what we mean by good and bad drinks.

"Of all the drinks we swallow, Nature's own supply of pure water stands pre-eminently first. It not only accomplishes, better than all others, the essential work of thinning the blood, but it gives to those who drink freely of it larger appetites and stronger digestive powers. Yet, strange as it may appear, in all climates and among all nations, people have always exercised their ingenuity in devising artificial drinks, or beverages, to take its place.

"These artificial drinks (or by far the greater number of them) are prepared by steeping in boiling water the leaves and seeds of certain plants, the flavours and properties of which give an agreeable taste to the beverage. You are all too familiar with tea, coffee, and cocoa in your everyday lives to need any lengthy description of them from me. I shall content myself with showing you a simple experiment.

"*So saying, the doctor* took a teaspoonful of dry tea and rubbed it into a powder in his hands. He put the powder into a flat watch-glass, and stood it on the hot hob of the fire-place, covering it over with a piece of white note-paper, rolled up into the form of a cone. As the tea became hot, wreaths of white vapour were seen to rise from it. Some of this vapour, of course, passed away, but most of it was caught inside the paper cone, and there it condensed, so that when after a few minutes he unfolded the paper it was found to be sprinkled with a white glistening powder, not unlike salt in appearance. He first passed this round for inspection, and then continued his discourse.



"Learned men call this white powder *Theine*," he *began, "and it is* a remarkable fact that exactly the *same ingredient is* found in the other beverage-making materials — the coffee-berry and the cocoa-bean, although the three plants themselves from which they come are, in outward appearance, totally distinct, and grow in different quarters of the globe.

"These three materials, tea, coffee, and cocoa, provide the daily beverage of fully seven hundred millions of the human race all over the world, and doubtless this fact is due to the presence of that white, powdery salt in each of them. Let me now tell you something about it.

"It has been found by experiment that this Theine, *when taken in moderate quantity,* has a marvellous sustaining power. It acts upon the nerves and brain, cheering and enlivening them, and, in some mysterious manner, supplying the nerve substance which they lose by wear and tear. It is, in fact, a valuable nerve food. More remarkable than all, it seems to exert, through the nerves, an extraordinary influence over the body itself, for it certainly has the effect of lessening the waste, in wear and tear, of the muscular tissues of the body. But, remember, this beneficial result only comes when these things are used in moderation, and here again I would repeat that even the best of God's blessings tend to evil rather than good, if, instead of using them, people abuse them. There may be, and there often is, intemperance in the consumption of these as of other good things, and when there is, bad results must follow. In these days of over-tea-drinking this truth cannot be too much enforced, for in some homes the tea-pot figures at every meal of the day, and becomes a source of much mischief. People who drink excessive *quantities of tea,* or take their tea too strong, suffer from nervous, uneasy pains in the head, continued wakefulness, tremblings in the limbs, and a dyspeptic state of the stomach. The fact is this Theine, used in moderation, is a harmless stimulant; it does good all round, for it cheers without inebriating. But when it is taken to excess, it becomes a very powerful spur, and acts injuriously upon the nerves and the system generally; and green tea is worse in its ill effects than black."

Rule I.—Food must be sufficient and suitable

Lesson VI

ALCOHOLIC BEVERAGES

"Let us now proceed to consider another class of drinks—the fermented or alcoholic beverages, beer, wine, and spirits," said the doctor. "These, like the infused drinks—tea, coffee, and cocoa—are prepared by steeping the materials (malt or grapes as the case may be) in hot water; but, unlike those drinks, they are not consumed hot as they are made. The simple infusion has to undergo a sort of partial decay before it is drunk.

"This decay, or fermentation as we call it, changes the sugar which is contained in the material itself into two entirely new substances—*alcohol* and *carbonic acid.*

"The alcohol (which is a burning, spiteful, fiery spirit) is absorbed into the liquor as quickly as it forms; the carbonic acid, being a gas, froths and bubbles up to the surface, where it passes away into the air and is lost.

"Beer and wine always contain a certain amount of the original sugar, undecayed and unchanged, and this helps to give them their sweet and pleasant taste; but they also contain some of that half-decayed, spoilt sugar, in the form of the fiery spirit—alcohol.

"The ardent spirits, as they are called—brandy, gin, whisky, and the rest—are pure alcohol, merely diluted with a certain amount of water, to make them drinkable. The pure spirit, as it leaves the still—proof spirit it is called then—is much too fierce and terrible in its nature to be drunk at all.

"It is no part of our business now to inquire into what these alcoholic liquors *are;* all we are at present concerned in is to learn what they *do,* when they are taken into the body as drink.

"If a gallon of strong beer were boiled over the fire, till all the water (and with it the alcohol) had passed away in steam, we should have at the bottom of the saucepan a residue of dry solid matter, weighing rather more than a quarter of a pound. This solid matter would consist of the unfermented sugar and what is left of the gluten of the grain—the former, as you know, a fuel-food, the latter a flesh-forming substance.

"It is sometimes asserted by those who wish to make a very strong case, that there is no nourishment whatever in beer. This, you see, is not strictly true, for it contains both flesh-forming and fuel-food. But how much of this nourishment does it contain? A gallon of strong beer yields a quarter of a pound. *That is to say a* man would have to drink a quart of the strongest beer to get one ounce of nourishment and there is a much smaller quantity in the light bitter ales which are generally drunk. In fact they contain less nutriment than the poorest of food would supply. A gallon of milk, treated in the same way over the fire, would yield nearly a pound of dry solid nutriment.

"I think I have said enough to prove to you that we may safely disregard the so-called nourishing properties of these drinks. Let us now turn our attention to the alcohol which they contain. This, as I have already said, is dissolved in the watery part of the beer or wine. When these drinks are taken into the stomach, it is only the watery part and the substances dissolved in it, which can be sucked up into the blood. The thicker, more solid portion is held back in the stomach, and digested like other food.

"The alcohol then is sucked up at once with the water into the stream of the blood, and in a few minutes is carried into the remotest corners of the body. But remember, this alcohol is not food; it has no power to nourish the body. It acts everywhere as a powerful stimulant on the stomach and all the internal organs, and urges them on to more vigorous action, just as the spur of the horseman urges on the horse.

"It is a great mistake for people to think that alcohol makes them stronger and more able to do their work. It has no more power to do this than the spur has to give strength to the horse. It urges on to further exertion for the time—that is the utmost it can do at the best. The stimulating effect soon passes off, and the body is left with less power than before to continue its exertions.

"If people would remember this, and take them only as advised by their medical man—in other words, as a sort of medicine, and not as a common beverage—there would be no evil result from the use of them. Indeed every doctor can tell, from his own experience, many a tale of the beneficial effects of alcohol, when it is administered according to his directions, as a medicine in cases of extreme weakness.

"The real danger lies in the treacherous nature of these drinks when they are habitually used. Their rich flavour and delicious aroma conceal a wily enemy below, waiting his opportunity to strike. The man who is moderate in his use of them to-day may, unless he hold a strong hand over himself, be caught in the toils of the enemy and become in time a confirmed drunkard. Remember, too, whatever may be said in favour of the moderate use of them, their intemperate use is a sure and certain source of misery, disease, and suffering.

"Let every one, who thinks he can with safety indulge his inclination by the habitual moderate use of these drinks, ask himself the following questions:—

"1. Can I under all circumstances of my daily life keep to the moderation, which I now lay down for myself?

"2. Have I strength of mind to resist the blandishments of my friends and companions?

"3. Can I afford to spend money on what is, after all, an unnecessary luxury, and may prove the curse of my life, and the ruin of those who are now nearest and dearest to me?

"It is important to remember this side of the uestion. A pint of beer costs, let us say, threepence.

Many a man will swallow this amount almost at a draught, and if he does it two or three times a day, it is easy to calculate the amount of money he positively wastes on profitless self-indulgence. Why, a single threepence laid by each day amounts at the end of the year to £4 : 11 : 3, and at the end of twenty years this modest saving would realise with interest the respectable sum of one hundred pounds. Set the daily pint of profitless beer by the side of this, and I think no further argument is required. The young man, at any rate, who started life by investing the price of his pint of beer instead of pouring the liquid down his throat, would find his hundred pounds far from profitless. Many men have made fortunes from smaller beginnings than that."

Rule I.—Food must be sufficient and suitable

Lesson VII

INTEMPERANCE

"Our investigation thus far into the nature of these fermented drinks," continued the doctor, "has shown us that the only part of them worth any consideration at all is the alcohol which they contain, for even the very best and strongest of them possess so little nutritive matter, that we may safely disregard it altogether.

"The alcohol itself is a stimulant, a spur, nothing *more; often* useful in the hands of the doctor as a *medicine, but* always dangerous and treacherous when *taken as* a common drink. Health and pocket both suffer from its habitual use, and those are wisest who put the temptation resolutely behind them.

"People will tell you (and it is perfectly true) that even doctors themselves are not all agreed as to the hurtful effects of alcohol, when taken in moderate quantities, and weakened with plenty of water; but there is no room for doubt of any kind when the limit of moderation is once passed, and the fiery liquid is poured into the blood in larger quantities.

"We are all, unfortunately, far too familiar with the sight of the poor, blear-eyed, grovelling creature—the victim of intemperance—to require any further proof of the evil effects of this poison. What can have happened to bring about such an awful change in that man or that woman—a change which is able to degrade God's noblest work below the level of the very brute creation? Let us see.

"Here is a picture which will show you what we are all like inside. This hollow box above and behind the face is the skull. Within its bony walls is lodged the soft, delicate marrow which we call the *brain;* and part of this marrow may be seen stretching downwards from the skull through the whole length of the spine or backbone. This is known as the *spinal marrow* or *spinal cord.*

"The marrow-like substance of the brain and spinal cord is nerve-matter. It acts the part of overseer or superintendent, to look after the different organs of the body, and see that they all do their work properly. This overseer-work, moreover, is beautifully arranged in three departments, each one being responsible for its own share of the business.

"The first of these departments is lodged in the upper part of the brain, and has charge of the *intellect*, the *will*, and the *memory*. We may call the overseer of this department the *Reason Overseer*.

"Another department is situated in the under portion of the brain, just behind the face, and the overseer who resides there has charge of the five senses—*seeing, hearing, feeling, tasting*, and *smelling*. We will call him the *Sense Overseer*.

"Lastly, there is a very important overseer lodged in the nerve-marrow, which joins the brain to the upper part of the Spinal Cord. The department over which he presides has charge of the *lungs* and *heart*. His duty is to see that the breathing-work of the one, and the blood-pumping of the other, go on steadily and without any break. Let us call him the *Breathing and Pumping Overseer*.

"Think for a moment of the work which each of these nerve overseers has to do, and you will readily see why I call the last a very important one. The *Reason Overseer* and the *Sense Overseer* can both take their intervals of rest. They are not always at work even in the day-time and at night they get their regular period of repose and sleep. How different it *is with the Breathing and Pumping Overseer*. The *work which he* guides and controls is incessant; it must go on night and day the same; if it ceased for even a few moments we should die. He cannot sleep, or even nap, at his post. He must act the part of an ever-wakeful *watchman*, as well as overseer, or the lungs and heart, losing his control, would neglect their proper work, and that would lead to choking, fainting ——death.

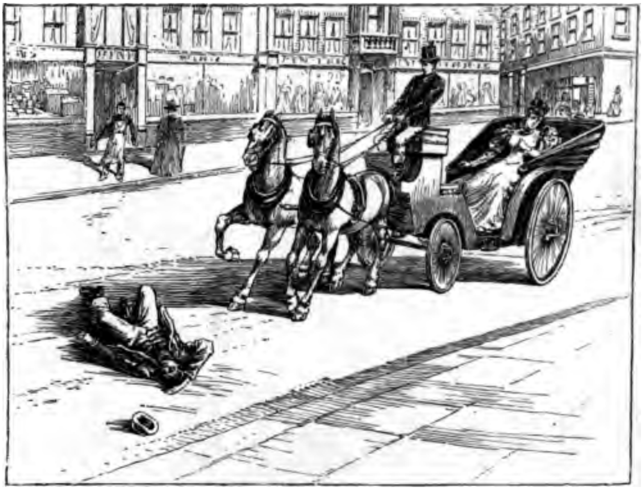
"Fiery, alcoholic spirit acts upon these delicate nerve overseers, by stupefying them and putting them all to sleep. It begins with the Reason Overseer, as he is more readily overcome than the others. The man who drinks these fermented liquors until the fiery spirit in them collects in his brain, ceases for the time to be a reasonable being, because his Reason Overseer has been put to sleep, or drugged, with the poison.

"In such a state, with reason, understanding, and memory fast asleep, the man acts like the brutes, without any rational knowledge of what he is doing. The least provocation may rouse him to the fiercest rage of passion and violence, because he has now no guide—no controlling influence over his actions—he is living a sort of brutal existence only. By and by, when the effects of the drink-poison have worn off, he will wake up, as it were, to a sense of his responsibility, but without the least knowledge or recollection of anything that has happened.

"What a terrible waking it must be to find (as many a poor wretch has done) the shadow of some terrible crime hanging over him—a crime of which he now knows nothing, but for which the law holds him fully responsible, because it was his own act which robbed him of his reason for the time being.

"*Every one who* indulges in these treacherous drinks should clearly understand that, while under their influence, it will depend in no way upon his own *Will,* but upon the mere chapter of accidents, whether he has some such awful awakening as this. Remember, when the *Reason Overseer* is put to sleep with fiery spirit, the man has no *Will.*

"But even though the man, who has brutalised his *Reason and his Will* in this way, does no actual deed *of violence* while in his state of drunkenness, yet it will be instructive to watch him as he swallows more and more of the fiery liquid. After a time he ceases to be dangerous to those around him, because he has no longer the power to act with violence. He falls to the ground and lies there, a senseless, motionless, helpless lump of flesh. He has at last stupefied his *Sense Overseer*, and sent him to sleep as well as the *Reason Overseer*.



" In this stage the poor wretch is dangerous, not to others, but to himself, for he has now no sense to perceive any danger which threatens, and no power to avoid it when it comes. He is indeed degraded now as far below the brutes as they are below reasoning man. People say he is dead drunk, but he is not actually *dead*.

"*Watch him* as he lies there. He still breathes heavily in his senseless, helpless, unconscious state, because the *Watchman* in charge of the Breathing and Blood-pumping work bravely remains at his post, in spite of the stupefying effect of the poison. He is the last to give up.

"It may be, however, that the man has already taken enough, not only to drug the Reason and Sense overseers, but to put the *Watchman* to sleep as well. If at last this overseer falls, overcome by the deadly *fumes, it is all* over. The breathing stops, and the *heart ceases to* beat. He is now not merely deadrunk, as people call it, he is really dead—dead too in e most fearful sense of the word, for he has been his wn destroyer.

"Remember, then, that drunkenness in its first age reduces man to the level of the brute; in the

nd stage it degrades him even below the brute tion, to a state of senseless, helpless stupidity; in third stage it means suicidal death.

"Let us turn away from these fearful scenes of *ery and degradation.* Here is a picture of a very different kind. It requires no description, for it tells its own story. It is the father's return to his happy home after the day's work is over. But this father is not a drunkard.

"Think what sacrifices those poor deluded wretches must make, when once they become slaves to the drink demon.

"If people would but take this more to heart, surely there would not be such a heavy roll of confirmed drunkards, as now disgrace our nationality."

Rule II.—There must be abundance of fresh air to breathe

Lesson VIII

THE VALUE OF PURE AIR

The doctor was well pleased thus far with the result of his labours, for not only did his audience show no signs of falling off in their attendance, but he could also see that they were deeply interested in what he had to say.

His next lecture was on the value of pure air, and he commenced by showing a few simple experiments with some jars of oxygen, which he had prepared beforehand in readiness. These experiments interested and astonished the grown-up part of the community not a little, but Norah and the rest of the girls were quite familiar with them, of course, thanks to Miss Brown's teaching.

"Our young friends," said the doctor, when he had finished, "are quite at home with all this. Indeed they could, I am sure, tell you all about it, as well as I can myself. I always call this oxygen *the burner*, because, as you see, it burns up anything and everything that comes in its way.

"Oxygen forms one-fifth of the entire bulk of the air around us. It is the oxygen in the air rushing through the furnace, that makes the engine fires burn. It is the oxygen in the air, which we breathe into our lungs, that makes our own internal fires burn. Without oxygen the fuel in the furnace would refuse to burn at all, there would be no heat—no steam power for the engine. Without oxygen the fires in our living engine would die out, our bodies would become cold, dead, powerless.

"I told you just now that one-fifth of the bulk of the air around us is oxygen; but you must remember that when I speak of air I mean only the pure fresh air which God supplies, not bad, tainted, poisoned air. As I walked along the lane this evening on my way here, my nostrils were all at once assailed by a most unpleasant smell, and looking round I saw in a corner of the field, on the other side of the hedge, a great heap of manure. The smell, of course, came from that; a vapour, bred from the decaying manure, was steaming up from the heap, and tainting the air all round.

"Vapours of this kind are constantly steaming up into the air from every sort of dead decaying matter, whether animal or vegetable. This is the way in *which all such matter* (*organic matter* we call it) is got rid of. Only the earthy or mineral parts of it crumble into dust where it lies.

"If our eyes were as sharp as our noses, we should see that these vapours are made up of crowds of tiny particles, which spread themselves through the air. I need scarcely tell you that they were never intended to be breathed by living creatures. They are *poison-vapours,* for they are bred of death and decay; we cannot breathe them without the most serious consequences.

"It is true the unpleasant sniff, which one gets while passing the manure heap, would not do any great harm, because the poison-vapours are scattered, and mingled with larger quantities of the pure air around, as quickly as they rise. But if all that pure air could be removed, and you were compelled to breathe those vapours in an undiluted state, it would be all over with you in two or three minutes—you would die, stricken down by those deadly fumes.

"One naturally hurries away from the manure heap, and at a distance of only a few yards the bad smell is no longer to be perceived. The fact is, these poison-vapours cannot exist in the presence of pure air. Not only do their tiny particles of decaying matter become scattered, but they are at once seized upon by the oxygen of the air, which burns them up, and destroys all their power for mischief.

"Remember, too, the air is seldom still; there is generally more or less movement in it. These breezes which blow are Nature's own purifiers. They sweep away and destroy the poison-vapours which rise from decaying matter, and so keep the air pure and fresh.

"*Nature in this* way provides an ample and nstant supply of pure air for all living creatures to reathe. The wild animals of the forest, and even the vage tribes of mankind, have no lack of it, for they end their whole lives in the open air. Civilised

an builds himself a house, to shelter him from the clemency of the weather, but the walls of his house hut out Nature's winds, as well as the cold and wet. et us see what is the result of this.

"A few *mornings* ago I called to see one of my *tients. I found* him in a very depressed state, and no wonder. The room itself was low and small, and had but one small window, and the moment I entered I knew that that window had been shut up close for many hours. I positively could not have remained in the room, unless I had thrown open the window.

"The truth is, the air of the room was laden with poison-vapour of as deadly a nature, in its way, as that which steams up from the manure heap. But how did this poison-vapour find its way into the air of the room, for the window and door were both shut up close? It had been steaming out of the man's body with every breath all through the night, and had not been able to escape from the room, because every outlet was carefully closed. Remember, too, this was not because he was ill, for these poison-vapours are bred in your body and mine, and in the bodies of all living creatures, just as they are bred in the heap of manure.

"Every part of the body becomes worn out and exhausted with its work, and in this state at once begins to decay and turn into vapour. This vapour, too, being bred of decaying matter, is as surely poison-vapour, as that which steams up from the decaying manure heap.

"Now think once more of Nature's winds which purify the air, and that will help you to understand clearly enough the whole purpose of breathing. The act of breathing blows fresh air through the living body to cleanse it from its impurities, just as the winds purify the air, and at the same time it provides the *means* by which those impurities may be carried off *with the breath.*

"*But you* must never forget that it is, in both cases, the oxygen in the air which does this useful work. Foul air which had been robbed of its oxygen would have no purifying effect, either in the body or out of it.

"My poor sick friend had been using up the oxygen of the air all night long, and had been pouring out into the room, with every breath, nothing but foul air in its stead. It was that foul air he was breathing over again when I entered the room—air laden heavily with poison-vapour.

"You will understand better what the condition of the air must have been when I entered the room, if I tell you that a man spoils by his breathing not less than a gallon of air every minute. You have all heard the horrible story of the Black Hole of Calcutta. This poor fellow, for the want of knowing better, had actually been making a Black Hole of his own bedroom by shutting it up close all those hours, while he was filling it with poison-vapours from his body, and spoiling it at the rate of a gallon a minute; and, of course, the longer he remained there the fouler the air would have grown. It would in time have become a veritable Black Hole."

Rule II.—There must be abundance of fresh air to breathe

Lesson IX

THE MISCHIEF OF BAD AIR

"I think," continued the doctor, "you will now clearly understand the necessity for keeping the air of your sleeping rooms as pure as possible. Remember, we spend a large share of the twenty-four hours in the bedroom, and, whether we wish to do so or not, we cannot help fouling the air of the room. We rob it of its life-giving oxygen with every breath we draw, and pour into it in exchange poison-vapours from our body.

“If, therefore, we shut our rooms up close, to make everything snug, warm, and cosy, as some people would say, we prevent those foul vapours from escaping and the fresh air from entering, and so matters grow worse and worse every minute.

“People who spend their nights in a close bedroom, rise in the morning altogether unrefreshed and uninvigorated—as tired, they will tell you, as when they went to sleep, and they cannot think why it is. The reason, however, is simple enough; their poor lungs have had nothing but foul air to breathe all night long, and when they wake in the morning the poison is still lurking in their blood. What must it be where two or three, and sometimes four or five people, sleep in a room shut up close like this.

“I should like you to try the experiment, when you rise to-morrow morning, of going straight out into the open for a few minutes. Then, after remaining there long enough to notice the freshness of the air outside, return to the room which you have just left. If it has been shut up close all night, the stuffiness of the air in it will at once make you feel that you can scarcely breathe at all. The difference is so marked between that air and the fresh, pure air outside, that *you will wonder* how it was possible for you to have *[illegible]mained in it* all the night. The air in such a room, in fact, is absolutely unfit for a human being to breathe. The treacherous nature of it, moreover, lies in the fact that, while you remain in it, you become so used to it that, even your sense of smell refuses to give you warning. You do not notice the foulness of the air, till you go out of the room and return again.

" Fresh air is particularly necessary for babies and young children generally, for they have to grow as well as live. Mothers ought to be as anxious to secure fresh air for their children as they are to see them fed, and perhaps more so. Never allow the little ones to contract the habit of sleeping with the head under the bed-clothes, for if they do, they will most certainly grow pale and weak, through breathing their own breath over and over again.

" I myself have often seen young mothers, in their extreme anxiety to make baby warm and cosy, cover it up in its cot with curtains and bed-clothes, in such a way that not a breath of fresh air can reach it. Poor mothers! they do it all in love and tenderness, and they cannot understand why the little thing wakes up hot, feverish, and fretful. But here again the case is very simple. Baby has been made to breathe over and over again its own fouled breath instead of good fresh air, and the poison-vapour is coursing through its blood.

" If the mother wants to see her baby grow up strong and lusty she must alter all that; for there is nothing so essential as fresh air, and plenty of it, to develop big, strong, ruddy, active, cheerful, clear-headed boys and girls, and they will make the men and women we wish to see.

" *What is it that* produces the stunted, weak, pale-faced, nervous men and women, whom we meet with in the crowded parts of our big towns? It is mainly the want of fresh air. They have lived from babyhood herded together night and day in close, impure apartments, breathing over and over again the poison-vapours which have been given off by themselves and those around them, and their pinched features, dull eyes, and languid, spiritless movements are the result of it. Thousands die in childhood, and those who reach adult age are unfit for real work, and consequently for the real enjoyment of life. In most cases they fly to stimulants for unnatural excitement, and become confirmed drunkards. Few, very few, ever reach their prime.

"The statistics of our insurance offices tell us that those who live in towns and work together in close, stuffy rooms die, as a rule, seventeen years earlier than those who live and work in the free, fresh, country air.

"I do not mean to say that country people are, all of them, wise and sensible in the appreciation of fresh air. The very abundance of it all round them perhaps makes them careless, or else why do we see, as we often do, the reeking pig-sty and the manure heap, to say nothing of the pestilential cesspool, close by their very doors and windows? In many of the labourers' cottages, too, the sleeping accommodation is very inadequate for the wants of the family, and by crowding together in small, close bedrooms at night, they certainly undo much of the good which they derive from the day's abundance of God's fresh air. Happily for them, it is not day and night the same, as it is with far too many of the poor in the crowded parts of London and other great towns.

"People who sit for two or three hours in the allery of a crowded church, theatre, or lecture-hall sually come out with splitting headaches, and a faint, sick, oppressed feeling all over them. The fact is, every individual in the crowded assembly has been fouling the air all the time with poison-vapour, while every *gas-burner, in* addition, has been using up as much *air as eleven* men, and those sitting in the gallery

get the foulest air in the room, because the breath, being warm, rises towards the ceiling.

"If a way is left open for it somewhere at the top

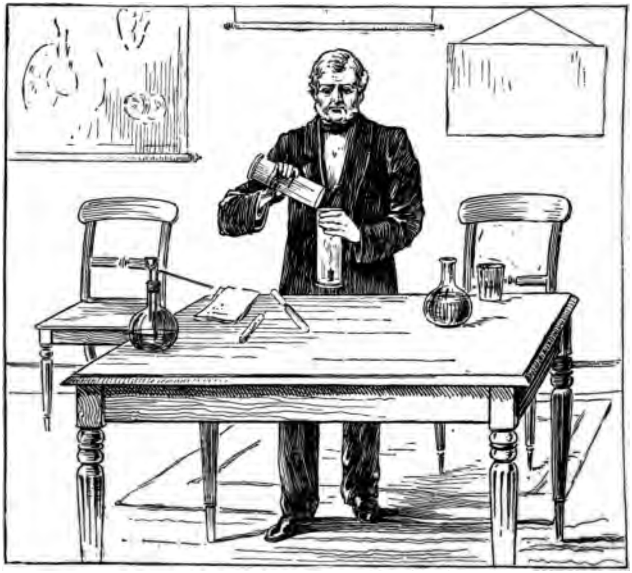
of the building, this poison-vapour will escape almost as quickly as it is formed, but, if not, it will collect there in a constantly increasing layer, which spreads lower and lower as it increases. Some years ago in the monkey house at the Zoological Gardens there was great distress among the keepers because the monkeys died off so fast. It was noticed that the poor animals, who were lodged in the upper tier of cages near the roof, always died first, and always of the same disease—consumption. They were placed there because they came from a very hot climate, and the keepers thought it would be *a nice warm place* for them; but all the time they were there the poor creatures were made to breathe the foul breath of those in the cages below, and it was this which killed them. The case was proved beyond doubt when the cages were altered, and made to range side by side, and from top to bottom of the room, for all this wholesale disease and death became a thing of the past from that time.

"I ought to tell you that the chief constituent of the foul air, both from our breath and the gas-burners, is the deadly gas—*Carbonic Acid.* I have some of it here in these glass jars. You cannot see it in the jars, because it is an invisible gas, and this perhaps adds to its terrors. It is like the lurking assassin who springs out unawares and stabs his victim to the heart; and it is able to do its murderous work as surely and suddenly as the knife or dagger. Let us learn something about this terrible gas."

So saying, the doctor proceeded with a few simple experiments. He showed the deadly nature of the gas by introducing into one of the jars a blazing taper. The flame was instantly extinguished, and he explained that this carbonic acid gas is as deadly to all living creatures as it is to the flame. It can strike a man dead as surely as a violent blow on the head.

He next poured the gas from one jar into another, just as we pour water, to show that it is very much heavier than the ordinary air.

"And now," he said, resuming his discourse, "I suppose you are wondering how it happens that this poisonous gas rises upwards to the ceiling if it is so much heavier than the air. I will tell you. It rises and floats in the air because the breath, as it leaves our mouth, is warm and light. Presently, when it cools, it will condense and become heavier, and then it must sink down to the floor.



"Perhaps it has never occurred to you that the *bedstead* is as absolutely essential as the bed itself for *securing healthy*, restful sleep at night; but it is so. *When bad times* come, and people are forced to part with article after article to keep the wolf from the door, the last thing they universally cling to is their bed. But it would be well for them, even then, to remember that a hard mattress or a paliasse on a bedstead, would be far preferable to the softest of feather-beds on the floor. They should struggle to keep the bedstead. And you can easily understand now the reason why. The carbonic acid gas from the breath rises to the ceiling at first, but it is bound to fall as the room gets cool, and then the sleepers on the floor must breathe it into their lungs."

Rule II.—There must be abundance of fresh air to breathe

Lesson X

VENTILATION

" I want now to give you a few simple, practical hints for keeping the air in your homes always sweet and wholesome," continued the doctor, " but before we enter upon this part of our subject, I should like to show you how Nature herself contrives to do the same thing in her great home.

" I have already explained to you the beneficial effect of the wind in blowing away the poison-vapours as they accumulate. We have only to think, however, of the countless numbers of living creatures of every kind which people this earth, and are every minute of their lives *helping to* foul the air with their breath, *and we shall see that* the blowing of the wind alone would not be sufficient to purify the air. The noxious vapours would be blown away from one place only to accumulate in another.

" It is here that Nature's beautiful provision comes in to prevent this. Vegetation of every kind actually requires for its existence the very *Carbonic Acid Gas* which is so hurtful to man and animals. Plants, in other words, take in for their sustenance what animals reject. They absorb the Carbonic Acid Gas of the air through their leaves, and break it up into its constituent parts — *Carbon* and *Oxygen.* They use the Carbon to build up their own substance, and they graciously return to the air the oxygen, which is useless to them, but is the very '*fire of life*' to the animal world.

" This is a splendid example of Nature's own Domestic Economy, in utilising even the waste, and turning it to good account.

" Let us now take a glance at some of Nature's children—the little bees in the hive. Low down in the scale they may be, but I think they can teach some of us a lesson, and help us to value fresh air more than we do. Thousands of them live together in the home which we provide for them—a sort of inverted, straw basin, with no window, no outlet of any kind, save the one small, half-choked entrance at the bottom.

" They, like all other animals, must breathe, and are every bit as much in need of pure fresh air as we are. Yet, strange as it may appear, in spite of their immense numbers, the air in their dwelling is never *close, stuffy, and* poison-laden. Indeed, it is said that *the air taken from* the inside of a hive crowded with bees is as absolutely pure as that which fills the open space all round it. How is this possible? Let us find out.

"If you stood near a hive you would hear an incessant buzzing sound, and if your eyes were sharp enough to see through its straw walls, you would soon be able to satisfy your curiosity as to the cause of it, for you would see, just inside the little entrance, a couple of dozen or more of the community busily engaged in flapping their wings rapidly backwards and forwards. They never pause for a moment till they are tired out, and then others come and take their places, so that this flapping goes on incessantly—some of them are always at work.

"They are using their wings as fans, and they fan the air with them to create an artificial breeze, which blows continuously through the hive, and thus keeps the air inside quite pure. Who taught them?

"In India, and other hot parts of the world, something very much like this is done, in a mechanical sort of way, to purify and cool the air of the dwelling. Large canvas fans called Punkas are fixed to the ceiling of the room, and these are kept constantly flapping backwards and forwards to fan the still, hot air into a breeze.

"Many contrivances are in use for purifying the air inside the dwelling, but they all resolve themselves into the same thing—the creation of an artificial wind to blow through the room. We call this *ventilation*, and the word itself comes from a Latin word which means '*to fan the wind*,' so that after all we go to the little bees for our first lesson.

"In *ventilating your* rooms I want you to clearly *understand that you* can scarcely have too much fresh air, provided only that you do not create chilling and uncomfortable draughts, for they will give rise to colds. We want the wind to do its purifying work in our dwellings as it does outside; but it is possible to have too much even of a good thing, and that means a draught.

"The first essential is to see that you secure an outlet near the ceiling for the escape of the carbonic acid gas, while it is warm and light. The next, and this is equally important, is to see that the air which enters the room to take its place, comes from a pure source. Air which comes from stuffy cellars and foul back-yards is contaminated before it enters the house, and hence the necessity for keeping the surroundings of the dwelling sweet and wholesome, otherwise your *ventilation will* only bring you tainted air to begin *with.*

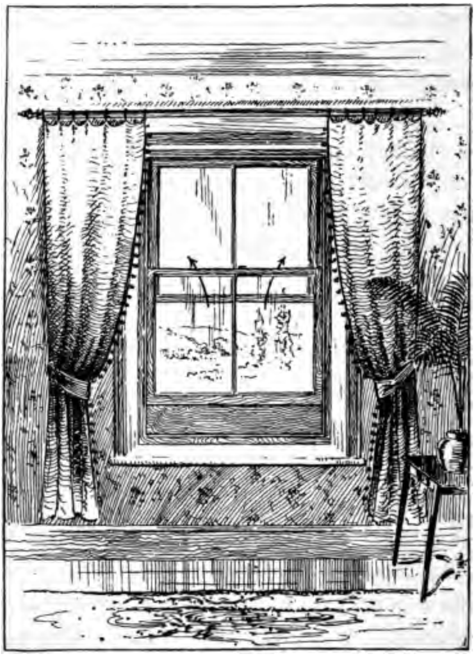
"It is not very likely that all of you will be able to afford the money to purchase the most approved valves and other appliances for ventilation; but, if not, there is no reason why you should be daily and nightly poisoned with bad air, simply because you are poor. God's fresh air is free to all; see that you get your full share of it.

"Should you find your rooms getting stuffy during the day, it is an easy matter to purify the air by lowering the top sash, and raising the lower one. This will at once cause a current of air through the room. The warm, light, impure air will be forced out at the top by the cool, fresh, denser air which enters from below, and in a few minutes the air of the room will be sweet again.

"Indeed, I cannot impress too forcibly upon you that the window is not intended merely to admit light into the room; and that it at all times affords one of the most effective means of ventilation. The atmosphere of a room cannot be fit to breathe, if the window is kept closed up.

"It is a good plan, except in the severest weather, to keep the top sash of the bedroom window down an inch or so day and night, for the escape of the foul air. The ventilating window-board, too, is a capital and simple contrivance for admitting fresh air without the danger of a draught. It consists of a piece of board three or four inches wide, and exactly the length to fit across the window. The lower sash is raised, and this board is placed beneath it—the sash, in fact, rests upon the board. This, of course, pushes the sash up, and makes *an opening* between it and the upper sash, *through which air* may enter in an upward stream, so that no cold draught can be felt by those in room.

“ But suppose my windows were not sashes; s pose they were not made to open at all. Do you thi



that, even under those conditions, I would submit to poisoned with foul air? Certainly not; under a circumstances I would see that I had my full share God's free gift—the '*fire of life,*' as I have alrea called it.

“*In such* a case I should bore a row of holes w *a large gimlet* through the upper part of every wind frame in the house, upstairs and down. By sloping the holes downwards a little, I should prevent any rain from dripping through into the rooms, and by means of a few wooden pegs I should provide against too much wind in rough, blusterous weather. But this simple contrivance would protect me and those dear to me from being poisoned in our beds."

Rule III.—The Body requires Suitable Clothing

Lesson XI

THE NEED OF CLOTHING

When the time for the next meeting at the Insti-ute came, the doctor was gratified beyond measure at what he heard. Such, it appeared, was the impression he had made on his audience, as regards the value of pure air, that in a great many cases the wives had succeeded during the week in enlisting the sympathy and co-operation of their husbands, who had been busily employing their spare hours in arranging one or other of the simple, but effective, means of ventilation which he had recommended.

"That's right," said the good man in his cheeriest nes, when he had heard what they had to say. That looks like real progress, and no mistake, and w let us proceed with the next step, and we shall e where this fresh air will lead us.

"The act of breathing, which is constantly blowing fresh *wind through* the body to clear away its ison-*vapours, also* serves to keep its internal fires burning. The constant rising and falling of the chest forcibly reminds one of the working of a pair of bellows, for, like them, it has to puff in blasts of air upon the burning fuel, and it is these air-blasts which fan the smouldering fires, and so keep the body warm, and provide it with vital energy for its work.

"The more deeply, rapidly, and vigorously we breathe, the warmer the body gets, as every one learns after undergoing some unusual exertion; it is like the blowing up of the embers in the furnace by a few vigorous pulls at the bellows.

"The natural, healthy heat produced by all this burning in the body is about 98° Fahrenheit. We call it *Blood-Heat,* because the burning first warms the blood, and the blood then carries the heat all over the body, in order that all parts of the body may be equally warm.

"In cases of fever the internal fires burn more violently than they ought, and then the blood, and of course the body, gets over-heated, as is shown by the dry, parched skin. On the other hand, they sometimes burn too sluggishly, and then the body is chilled, and performs its functions in a languid, desultory manner. This is always the case when the breathing is weak, slow, and laboured, because such breathing cannot blow in sufficient oxygen.

"It is the nature of warm bodies, when placed in a cool atmosphere, to gradually give up their heat in rays, or by *radiation,* as we say, to surrounding objects, in the endeavour to make them as warm as themselves, *and the cooler* the atmosphere, the more rapidly do *they part* with their heat.

"If a bright, metal pint-pot were filled with boiling water, and stood in the open air some frosty day in mid-winter, and another similar pot were placed at the same moment on the table in a warm room, the one outside would part with its heat much more rapidly than the other. If, moreover, a strong keen wind were blowing, the loss would be as rapid again, as it would in still air, because each little particle of the cold moving air, as it touched the warm pot, would rob it of some of its heat and convey it away. In either case, indoors or outside, the loss of heat would go on, till the pot and the water in it were reduced to the same temperature as the air around.

"Now exactly the same loss of heat goes on from every part of the surface of our bodies, as from the vessel of hot water, and it is greater or less according to the surrounding temperature—much greater in the winter than in the summer.

"Yet in spite of this loss, the healthy living body never gets cold. In the frosts of winter, and in the heat of summer, it steadily maintains the one temperature of *Blood-Heat*, or 98° Fahrenheit.

"This is due, in the first instance, to our internal fires. The fuel supplied to them in the shape of food, and the air-blasts puffed into them by the mechanism of breathing, are able to produce heat as rapidly as it is thrown off, and the result is that the body feels comfortably warm.

"If more heat is produced in those fires than can be thrown off from the surface, the body feels uncomfortably hot; if more heat is given off than those fires can supply, and keep up, the body feels uncomfortably cold.

"You have only to think of your own appetites, and you will at once understand how Nature regulates the heat of the living furnaces to suit all temperatures. How much more hungry we all are, for instance, in the winter than in the summer-time; and how much more relish we have for fat meat. This is no mere whim on our part; it is Nature's own provision for supplying more fuel to the furnace in the cold season of the year.

"During this season, too, the keenness of the atmosphere forces us to increased bodily activity, and the consequent acceleration in breathing fans the fires with its air-blasts into more vigorous play, so that more fuel is burned, and more heat produced, to meet the increased demands made upon the body by the surrounding air.

"But this is not the only provision which Nature makes. Think for a moment of the pot of boiling water once more. It would be an easy matter to very considerably retard the loss of heat from the vessel, by wrapping it up in fur, wool, or some such non-conducting material, before placing it in the cold frosty air.

"Nature in like manner protects all her creatures, except man, from the ill effects of the too rapid loss of heat, by providing them with a covering for the body; and she makes that covering suitable for the changing seasons of the year. As winter approaches, the coat, whether it be wool, hair, fur, or feathers, thickens considerably, so as to make a close covering to economise the heat produced by the internal fires, and prevent *it from being* wasted by too rapid radiation from the *body.*

n the return of the warm weather these coats
lly, and of their own accord, become thin once
for the hairs and feathers both begin to loosen
ir roots and fall out, and the body is left more
give up its excess of heat to the air, and so
ve its normal temperature as easily as it did with
ick coat, in the time of winter frosts. It is in
vay that Nature provides her creatures with a
e of clothing for summer and winter.

The human race alone seem at first sight to have
left uncared for, in the matter of covering for
bodies. The head, it is true,
ts natural covering of hair,
his is only because the brain,
ost delicate part of the whole
inery, is lodged within it, and
air is intended to act as a
thatch, to protect that organ
st injury arising from either
xcessive heat of the sun, or
inclemency of the weather.
rest of the body is entirely
and unprotected.

A closer investigation will ex-
the reason for this. Each of
ower animals has its own par-
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rovision which Nature makes
fore for covering these crea-
is amply sufficient for all climatic changes
they have to encounter.

"On the contrary, it was never intended that the human race should be confined to any particular region of the earth. They make their home beneath the burning skies of the tropics, and in the midst of the perpetual snows of the Frozen Zone. To them therefore a naked skin becomes an absolute necessity; thei own ingenuity provides them with artificial covering of some sort, which can be readily adapted to every change of climate.

"Thus in many parts of the world the temperature of the air rarely falls more than two or three degrees below blood-heat, and consequently there is little or no radiation of heat from the body. Under such circumstances there is no need for clothing at all, except for the sake of decency; and where clothing is worn it is always of the thinnest and lightest character.

"On the other hand, in the frozen regions near the poles, man has to encounter the most intense cold. The winter temperature of these parts bears about the same relation to the heat of the tropics, as ice bears to boiling water. There the heaviest and thickest woollens and furs that can be obtained are absolutely necessary to prevent the waste of the bodily heat."

Rule III.—The Body requires Suitable Clothing

Lesson XII

CLOTHING AND HEALTH

"Our climate," continued the doctor, "although subject to neither the burning heat of the tropics nor the intense cold of the poles, is a very variable one, and the changes in temperature are often so sudden and so violent, that considerable care is required in the choice of clothing, if we wish to preserve the body in good health.

"I intend now to give you a few Golden Rules for the proper management of your clothing, and I hope you will store them up in your memories, and make them your future guide in this all-important matter. (1) *Always wear a woollen garment next to the skin.* I have already shown you that, in the cold weather the heat of the body has a great tendency to fly off into the nipping air all round. Our chief concern, therefore, after feeding the furnace *with fuel, and* fanning it plentifully with blasts of fresh air, should be to see that the heat, which we have been at so much trouble to generate, is not wasted.

"Wool, you know, is a bad conductor of heat. A woollen garment next to the skin affords the best possible means of keeping in this bodily heat; it will not allow it to escape, and so the body is kept comfortably warm even in the coldest weather.

"But (and this I wish to impress very forcibly upon you) the woollen under-garment is as necessary in the summer as in the winter. Should flannel be found too thick or too irritating to the skin, merino will serve the purpose equally as well, but in any case the material should be wool of some sort. Let me explain why.

"You are of course all familiar with the common simple remedy in case of headache. You dip a piece of linen rag in cold water and lay it on the head. Almost at once you see vapour begin to steam up from the rag, and after a time the head becomes cool, and the pain is relieved. What does this mean?

"Nothing but heat could change the water in the rag into vapour, and the heat which does it comes of course from the sufferer's head. The linen, being a good conductor, allows the heat to pass off with the vapour—the very thing that is wanted.

"The result would be totally different if a piece of some woollen material were used instead of the linen, for that would hold back the heat, and not allow it to escape, and so the head would not be cooled.

"*Perspiration*, as you know, is the chief function *of the skin.* It goes on much more vigorously in the summer than in the cold weather—indeed, very slight exertion on a hot day is sufficient to throw the body into a profuse perspiration. This is Nature's way of cooling the over-heated body; but in a climate like ours it is full of danger, unless people take proper precautions.

"The under-garment, whatever material it may be, soaks up the moisture as it exudes from the pores of the skin, and more and more heat is drawn from the body to get rid of it by evaporation. If that under-garment be made of linen or calico, or any other heat-conducting material, the heat will quickly pass away, and leave it cold, wet, and clammy—a sure cause of chill to the body; whereas a woollen material will not allow the heat to escape, and consequently the body feels no chill.

"(2) Let Nature be your guide, and *always put on thicker clothing as the cold season approaches.* Think of the short, sleek, silky, summer coat of the horse, and then picture it as it appears in mid-winter, thick and long—almost woolly in its nature. Notice the marked difference in the summer and winter coat of the cat and rabbit. Even the thick, shaggy coat of the white bear becomes more thick and shaggy as the winter draws near, and with this covering he can brave exposure to the severest cold, for ice and snow and piercing winds have no power to chill and freeze his life-blood.

"In like manner our winter clothing should always be made of non-conducting material, to prevent the loss of our bodily heat, and it should also be thick enough to prevent the cold winds from chilling the warm surface *of the body. The thin*, merino under-garment should at the same time be exchanged for a good flannel one and, last but not least, thin shoes should be laid aside for thick-soled boots, to keep us well up from the damp ground.

"(3) With the return of spring, follow Nature once more, and *do not be in a hurry to cast off your thick clothing.* Many people lay up for themselves trouble, sickness, and perhaps permanent disease, by foolishly taking advantage of the first few mild days of spring to change their winter clothing, forgetting altogether that, in a climate like ours, we cannot be sure that the severe weather is all gone. They would do better to wait till they see Nature taking away from the birds and beasts their thick winter dress.

"(4) *Do not expose yourself to a sudden chill without taking the precaution to put on an extra garment.* This is a rule which should be strictly adhered to, when going out into the cold night air after sitting in some heated, crowded room. The violation of it has brought trouble on thousands. The garment itself should be made, of course, of some non-conducting material. It would then not only be serviceable in warding off the cold winds, but it would at the same time provide a further barrier against the escape of the internal heat, and there could thus be no chill to the body.

"(5) For the same reason, *do not sit in a cold, draughty place without putting on an extra garment.* It is better by far not to sit down at all in such a place, but to keep on the move, so that the brisk exercise may induce a healthy, vigorous circulation, for that is the best protection against a chill—more especially so when one is over-fatigued or thinly clad.

"(6) Should you get wet, *always change your clothes at the very first opportunity.* To this rule I would add, *never sit in your wet clothes*, but keep briskly on the move till you are able to change them, for this will tend to ward off the danger of a chill, by maintaining a vigorous circulation of the blood.

OLD-FASHIONED DRESS.

MODERN COMMON-SENSE DRESS.

"I have already shown you how the chill is brought about in such cases, by robbing the body of its heat to change the perspiration into vapour.

"From the nature of our climate wet feet are more common than wet garments, and they should be especially guarded against, as they are a *prolific source of danger to health.*

"(7) And now lastly, a word to mothers. *Do not expose the chest, arms, and legs* of your little ones, with the foolish hope of 'bringing them up hardy,' for this is an exploded idea. Those who do it, so far from bringing their children up hardy, really kill them if they are at all weakly; for in proportion to their size, children have a much greater surface than their elders, from which the bodily heat may escape, and require to be clad as warmly, or more warmly, than we do."

Rule III.—The Body requires Suitable Clothing

Lesson XIII

CLOTHING AND ILL-HEALTH

"I have endeavoured thus far," resumed the doctor, after a short pause, "to point out to you the advantage of warm, suitable clothing, in maintaining the bodily heat, and preventing that most dangerous of all evils—a chill. You now understand why suitable clothing is as necessary to the health of the body, as food and fresh air. Clothing, it is true, does not *make us warm*—it is the work of the internal fires, fed with food and fanned with fresh air, to do that—but it *keeps us warm*, by making the most of the heat produced by those fires, and preventing it from being unduly wasted by radiation from the body.

"I have now a few words to say about the evils of *unsuitable* clothing, and I shall begin with that most pernicious article of dress—the woman's stays or corsets.

"Ask a woman why she wears stays, and she will probably say that she could not hold herself upright without them—she would miss their support so much that she would seem to have no strength—she would feel, in fact, as if she were breaking in two if she left them off, and so on.

"The truth is, she has got into the habit, from girlhood, of looking to her stays for support, when she ught to have trusted Nature, and relied upon the ood solid frame which Nature has given her.

"We never hear any of these complaints from the ther sex. Men do not wear stays, yet they have no ifficulty in holding themselves upright; and the esult of it is that we do not meet with half as many rooked, consumptive boys as girls.

"Ask some fond, doting mother why she puts her irls into corsets, and she will tell you that she wants he dear girls to grow up genteel and graceful—that a girl is nothing to look at unless she has a good figure—that she might as well be out of the world as out of the fashion—and other rubbish of a like character.

"Poor misguided mother! as if a waspish waist could ever be considered graceful or beautiful. If we paid a visit to one of our museums for the purpose of studying the old Greek statues, we should find no wasp-waists among the female forms there, and yet for thousands of years artists and sculptors have been copying those old statues, as the most perfect type of female beauty.

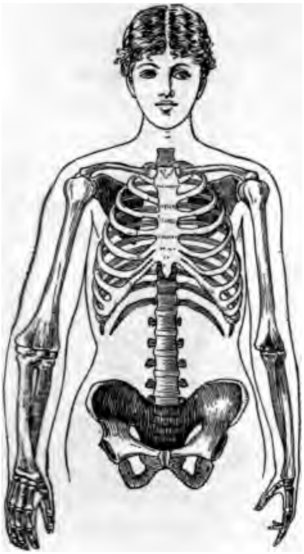
"The truth is, those old Greeks were not only the most beautiful race the world ever saw, but their women were never guilty of the foolish and wicked practice of lacing themselves in with tight-fitting stays and the figure which their sculptors loved to carv in marble wer models of Nature perfect work—figures which ha not been spoilt an distorted by foolis fad or fashion.

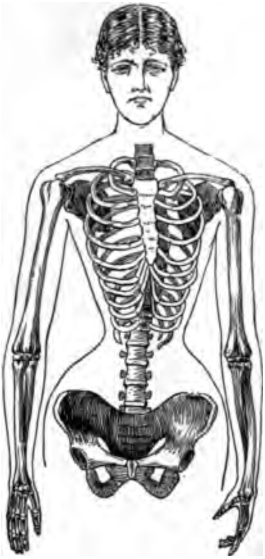
"This consideration alone ought, I think, to dispel all those ridiculous notions, which connect womanly beauty with a small waist. Never forget that the narrow, waspish waist is unnatural, and that things that are unnatural, so far from being beautiful, are positively ugly.

"We need not, therefore, trouble ourselves any further with this aspect of the case. Let us rather turn our attention to the evil results which this ridiculous and baneful practice has upon the health o our girls and women.

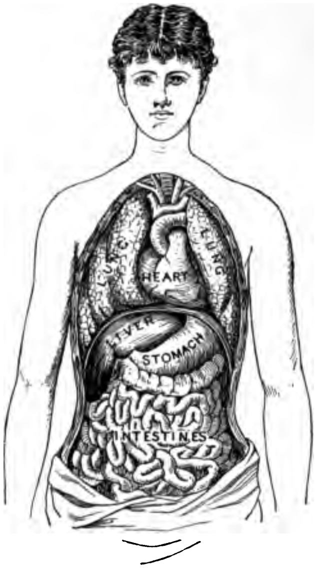
"A woman faints, and what is the first thing you do? You cut open her stays, because you know, and you are not ashamed to say, that she will breathe more freely without them. Let me explain why this is.

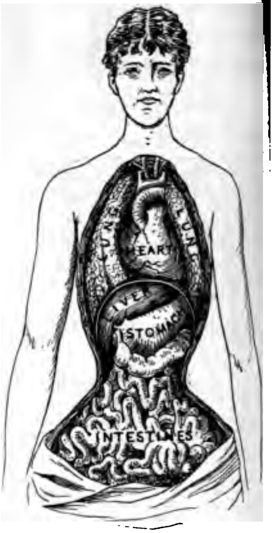
"Here are two pictures. The first shows the internal arrangement of the ribs as they are in every healthy girl and woman; the second shows the same ribs distorted by tight-lacing. In the one case the mother allowed her girl to grow up as Nature made her; in the other she presumed to improve upon Nature's work. 'Growing girls,' she would say, 'require support,' *and this is* the result.





"*By putting* her child into tight-fitting stays, she bound and pressed in those twelve pairs of ribs, and the bones, being soft, yielded to the pressure, till at last they were squeezed into an entirely different shape. The mother wanted her child to have a small waist; but she left out of consideration altogether the bony box—the chest—which these ribs form above





the waist. She got her wish, but think of the terrible price she paid for it. The box was contracted to ver much less than its natural size, and the rib bones instead of being free to move, grew together distorte as they were, so that the poor girl must always hav felt as if she were in a vice.

"Now look at these two pictures. You will easil *recognise this one,* for it shows the healthy, wel developed chest of our first picture, and we can see the heart, lungs, liver, and stomach in the positions which they ought to occupy. One glance at the other will show you how cruelly and viciously these organs have all been cramped up and forced out of their positions by tight-lacing.

"But this is not all. They have been pressed in and held fast, for so long, that they are unable to do their work properly, and gradually become weaker and weaker till active disease sets in.

"We have only to think of the lungs, and the all-important work they have to do, and the horrors of this suicidal mania for tight-lacing will appeal all the more forcibly to us. How can those wonderful lungs do their bellows-work of blowing in blasts of air, sufficient to fan the internal fires into vigorous burning, when they are bound and held fast within that distorted narrow cage?

"A pale-faced, fashionable lady, who prided herself on her slender figure, once asked her doctor whether tight-lacing was a bad thing for consumption. The doctor, looking at her squeezed-up waist, replied, 'Oh no, my dear madam, it is certainly not a bad thing for consumption, it is one of the things consumption thrives on. It is estimated that fully 15,000 women die every year from diseases which are undoubtedly the result of the evil practice.'

"But where is the woman who will acknowledge that she laces herself in? 'I don't lace tight,' nine out of ten women will say, if one ventures to expostulate with them. It is a good thing to remember (if stays or corsets are to be worn at all) that a woman's waist *is much smaller* when she stands than when she is seated. If due allowance were made for this, thousands of young girls, who now pass through a life of suffering and sink into an early grave for the sake of gratifying their vanity, would live long happy, healthy lives.

"I can safely say this," concluded the doctor, "that if I had a son I would warn him, with all the eloquence I could bring to bear upon the subject, never to marry a wasp. Depend upon it, a girl with a wasp-waist can never be strong,—never make a man a good wife. Like all wasps, she will have a sting, and her sting will be ill-health. She may not show it just now, but the evil day will be sure to come.

"A healthy wife is the greatest blessing a man can have; and a natural waist with plenty of room to breathe and move is a sign of both good health, and good common sense into the bargain."

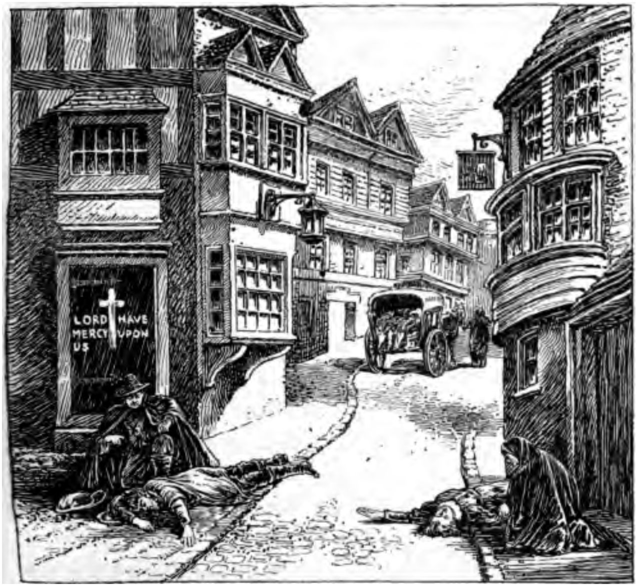
Rule IV.—Cleanliness before all things

Lesson XIV

THE PLAGUE OF LONDON

"What an awful sight!" said the women, one to another, as they stood spellbound before a large picture, which the doctor had hung up in readiness for the next lecture. "Why, that horrible cart is filled with dead bodies, piled one above the other. They must have been flung into it anyhow, from the way in which they are huddled together. How dreadful! What can it be, and what can be the meaning of that cross, and those awful words, which seem to have been painted on the door of that house? What can have happened to those poor people who are lying on the ground?"

"Ah," said Norah, who, with several of the girls, was likewise gazing intently at it, "this is a picture of the Great Plague of London. We have seen it before, haven't we, girls? It tells us of a dreadful thing that happened in London more than two hundred years ago."


LORD HAVE MERCY UPON US

"Yes, my friends," said the doctor, who just then came into the room, "Norah is quite right. This picture tells the story of one of the most awful visitations that ever befell any civilised community. The lesson it teaches is such a forcible one, and has such a direct bearing upon our health lectures, that I intend to give you a full description of it this evening.

"London, as it existed two centuries and a half ago, was a totally different city from the London of to-day. It consisted of very narrow, winding streets, packed close on either side with tall houses which shut out most of the sunshine, and in those houses no fewer than four hundred and fifty thousand human beings were crowded together, for London even at that time was one of the largest cities in the world.

"But besides being one of the largest it was, I am sorry to say, one of the filthiest cities in the world, and that is why I am telling you the story of this fearful visitation, because I wish to emphasise the horrors and dangers of filth.

"Filthy it must have been, for by far the greater part of the waste matter from all this vast community of people was thrown out into the street, because no better way of getting rid of it had then been found, and there it was trodden under foot, or left to rot and putrefy in heaps, and in sly holes and corners, filling the air with deadly poison-vapours.

"This was the state of things in London in the year 1665, when the terrible pestilence broke out; and during that one single summer more than a hundred thousand of its inhabitants—one out of every four nearly—perished.

"People were stricken down without a moment's warning, as if they had been felled by an unseen blow; and this is why, for want of a better name, the awful visitation came to be called 'the Plague'—a name given to it from an old Greek word which means *to strike.*

"The poison-vapour from all that accumulation of putrefying filth filled the air which these poor creatures were compelled to breathe: that was the unseen enemy which dealt the deadly blow. Even the blessed rain, Nature's own purifier, although it must have washed some of the filth down into the Thames, no doubt did more harm than good in stirring up the stench.

"Puffs of the pestilential vapours seemed to come from everywhere, and everywhere spread death and desolation. In the workshop, in the counting-house, in the market, in the open street, and in the quiet family circle it was all the same. The fatal, unseen blow fell, regardless of age or sex, poverty or wealth.

"In a short time business of every kind stopped, and all who could do so fled from the city. It is estimated that fully two hundred thousand Londoners left their homes and lived in the woods and fields during the summer of that never-to-be-forgotten year. But what an awful time it must have been for those who were not able to go away, for it was upon them that the pestilence worked its most terrible havoc.

"They shut themselves up in their houses in the hope that this might save them, but the hope was a vain one, for their walls and doors and windows could not shut out the foul vapours; and soon the great red cross and the solemn words, *Lord have mercy upon us,* painted on the doors, began to tell from day to day—nay, from hour to hour—where fresh victims had been stricken down.

"In the dead of night carts were sent round, and *the awful cry, 'Bring out your dead,'* resounded through the narrow streets, and summoned the bereaved ones who still survived to hand over for burial the already blackened and putrefying corpses of those who, but a few short hours before, were perhaps their nearest and dearest on earth.

"And what a burial it was! Imagine, if you can, the feelings of the poor, unhappy creatures when they saw their dear ones ruthlessly flung by those inhuman ghouls into the awful cart among a heap of other corpses, and watched it roll away in the darkness towards one of the horrible pestiferous pits, whose mouth yawned to receive the ghastly load.

"Think, too, how much more poignant those feelings must have been, when each one was hourly expecting his or her turn to come next. But words fail altogether to describe the horrors of this awful time.

"It may help your imagination, if I tell you that in one single night—the most terrible night of all—death claimed no less than four thousand victims. Early morning dawned, and the summer sun rose upon four thousand blackened corpses, who were living beings when he set the night before.

"But I will not weary you with any more of these horrors, for I am anxious to pass on to something practical. The grief-stricken people themselves looked upon the fearful visitation as a punishment sent direct from God, and so perhaps it was, but not in the sense they meant. It was the inevitable outcome of their filthy habits, and in this sense certainly the punishment was terrible indeed.

"God had given them fresh air and pure water; *they themselves* had chosen to poison the one by *neglecting* to make good use of the other, and widespread death and desolation was the simple, natural result.

"The poor, half-demented creatures, crazy with terror and superstition, who rushed about the streets almost naked, shouting wildly, in imitation of the prophet of old, 'Yet forty days and London shall be destroyed,' were altogether wrong; and so was the dazed, horror-stricken wretch who wandered about through the city day and night, beating his breast, and hoarsely whispering, 'Oh the great and dreadful God.'

"London was not destroyed, but strange to say the very next year another awful visitation came in the form of the Great Fire. This, although terrible and ruinous at the time, was really a blessing in disguise, for a very large part of the filthy slums was devoured by the flames, and a new London arose phœnix-like on its ashes."

Rule IV.—Cleanliness before all things

Lesson XV

CLEAN DRAINS

"The great city has made mighty strides since the year of the Great Fire, 1666," continued the doctor. "Bit by bit the London of old, with its narrow streets of tall overhanging houses, is disappearing, to make way for broad thoroughfares open to the free fresh air and daylight, while the very roadways and footpaths, instead of being full of hollows—ready receptacles for the accumulation of filth—are kept smooth and level by *good paving.*

"London itself is now constituted a County. It covers nearly 118 square miles, and contains a population of 4,231,431 souls, according to the census o 1891.

"If, however, we include the suburbs or outlying districts, this Greater London, as it is called, has a radius of 15 miles from Charing Cross in every direction it covers upwards of 688 square miles, and its population, according to the same census, is given as 5,633,332. Its streets and roads, if they could be placed end to end, would stretch to the amazing length of 8360 miles. Truly it is well named 'Mighty London.'

"But in spite of its enormous size, and its greatly increased output of waste and dirt from such a multitude of living beings, and in spite of many still existing evils, London can to-day boast that it is one of the healthiest cities in the world; and it owes this proud position to a plentiful use of pure water.

"Waste matters are not thrown into the open streets now, and left there to putrefy, and poison the air with their deadly exhalations. Instead of that they are all carried off, and deposited in the open sea miles and miles away from the great city.

"Beneath the streets and roadways everywhere, underground channels—the sewers—have been constructed, and leading into them from every single house are smaller channels—the drains—which carry away from each dwelling all offensive and decaying matter before it has time to work mischief. I should remind you too, that what I have said of London applies with *equal force to* all our towns.

"*But perhaps* I am not quite correct in saying that hese drains and sewers carry the filth away; they provide the channels it is true, but the real carrier that does all the work is water. Waste, decaying, poisonous matter is washed away along these underground sewers by the agency of water; and let me point out to you that here again we have learned to imitate Nature.

"Let us consider for a few moments the rain which falls from the clouds. It would be an utter impossibility to try to form any conception of the enormous quantity of pure fresh water, which the clouds pour down upon the earth in the course of a single year, for it must be borne in mind that all the rivers on the earth, from the tiny rippling brook to the broad mighty stream thousands of miles in length, are fed by the rain, that in fact every pint of fresh water in, on, and under the earth, fell from the clouds as drops of rain.

"When we remember how perfect Nature is in all her work, it is impossible to conceive that all this vast quantity of pure fresh water is poured down upon the earth without some all-wise purpose. The truth is, the rain was intended by Nature to act as the helpmate of the winds in their cleansing and purifying work. It washes the surface of the earth, and sweeps away in its course all dangerous decaying matters that come in its way, while the winds scatter and destroy the poison-vapours which are bred from them.

"The rain does more than this, for owing to its absorbent nature, it greedily sucks in carbonic acid gas from the air as it falls, and so helps to purify the very air itself.

"Now let us see what this brief survey of Nature's cleanser—the *rain*—teaches us. Acts of Parliament *have provided the* channels for carrying away filth of all kinds from our midst, but no Act of Parliament can provide that those channels shall be rightly used. That is a duty which devolves upon each and all of us in our respective homes.

“Thoughtless, careless people are very apt to throw their waste matter into the drains, without giving it or them the smallest further consideration, under the mistaken impression that, once there, the filth has no longer any power for mischief. They too often forget that it cannot move of itself—that it must be forced onwards, or it will before long choke up the passages altogether, and prevent anything else from passing away.

“Remember, water is the only agent that can do the work of carrying away the waste matters from your dwellings, along the drain-pipes, and so into the sewers. You have no lack of water; use that water freely, and see that your closets and drains are well flushed every day, and several times every day, so as to make sure that all bad, dangerous matter is washed clean away.

“I should like you to understand, too, what I mean by flushing the drains. A constant dribble of water is next to useless. What is wanted is a good moving force, to drive everything before it through the pipe, and this can only be supplied by a few pails of water. Do this, as I say, two or three times in the course of the day, and you will have no trouble with your drains. You will have done, in fact, all that you can be expected to do; the local authorities, assisted by the rain which runs down the sinks in the roadway, will keep the sewers themselves clear.

“It is of the highest importance to remember that [illegible]e *drains* cannot do the work for which they are in-

tended if they are allowed to get choked up, and that, so far from being serviceable in the removal of danger, they become in themselves an actual source of danger.

"Choked-up drains are, practically, nothing more than receptacles for the accumulation of decaying filth and the poison-vapours bred from it. The filth itself remains in the pipe and helps to choke it more and more, but these vapours *will* find a way of escape in one direction or another. They cannot pass away into the sewer, because the outlet is blocked in that direction, and so they make their way by the only course left open to them, that is back towards the house, and even the useful syphon-trap at the entrance to the drain is powerless then to keep them out.

"The truth is, the water which flows downwards from the trap is heavier than these vapours, and they bubble up through it, and so fill the house itself every time the plug is drawn. If people, then, through carelessness, allow their drains to get choked up, and out of order, they, by their own act, reproduce on a small scale the horrors of the Plague, for one puff of those deadly poison-vapours may be sufficient to strike down their nearest and dearest, and in any case their negligence can only end by bringing in its train sickness, disease, suffering, and expense.

"A friend of mine once said that the very thought of such people led him to picture to himself some maniac, going to the trouble of making snug little nests beneath the flooring of his house. closing every outlet except through the floor itself, and then filling the nests with poisonous snakes, which sooner or later would be sure to make their way upwards into the house, and bring death to all within it.

"My last words on this all-important subject are:—(1) *Never neglect a bubbling sound in the trap of the drain*, or *the pan of the closet*, for this is a sure sign that there is a stoppage somewhere in the drain-pipes—that there is an accumulation of waste matter in them, which is every moment giving off poison-vapours. It is the poison-vapour, in fact, which is bubbling up through the water.

"(2) *Never neglect a bad smell from the drains*, for this, too, is a sure indication that poison-vapours from them are rising upwards into the house.

"Take the bubbling sound and the offensive smell as friendly warnings of the presence of an unseen enemy, and never allow yourself a moment's rest till the enemy is attacked and vanquished, or, in plain English, till the drains are free once more, and all that is dangerous and offensive finds an easy and ready passage along them to the sewers. Then, and not till then, will those friendly warnings cease."

Rule IV.—Cleanliness before all things

Lesson XVI

Clean Bodies

Owing to a variety of causes, the doctor was unable to meet his friends at the Institute on the appointed evening, and the meeting had to be postponed for another week. "Never mind," he said to himself, "it will give them longer to think over the subject of our last discourse. Free and open drains are so ssential to health that this is a subject which certainly annot be too deeply impressed upon their minds."

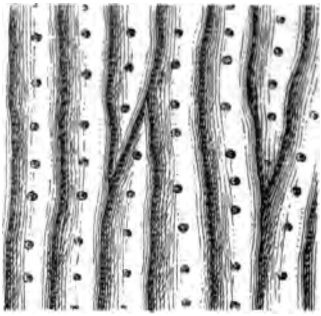
I think the whole matter must have impressed tself very deeply on the doctor's mind, at any rate, for when the meeting did take place, he showed by his irst words that drains and drainage were still uppermost in his thoughts.

"We have not finished yet, my friends," he began, ' with the subject of drain-pipes, and the useful work they are intended to do. The drains we discussed at our last meeting were those which the landlord provides, to carry off the waste matters from the houses in which we live. Those which I now intend to describe do precisely the same work, but the houses which they are intended to keep wholesome and pure are not built of bricks and mortar; they are the houses in which *we ourselves*, in an especial sense, dwell—our bodies.

"'What, drain-pipes in our bodies!' I can imagine you whispering to yourselves; and I at once answer, Yes, my friends, and it is clear that the Great Landlord Himself, who provided *us* with this dwelling, knows the value of perfect drainage, for he has given to each of us nearly thirty miles of drain-pipes for the removal of waste poisonous matter from it.'

"Let us proceed at once to examine into the nature of these drains. You know that your body is covered all over with a soft smooth covering which we call the skin. I say smooth, because to the naked eye it presents a smooth, almost unbroken surface; but if I could show you a piece of this skin, with the aid of a microscope, *you* would find that it is not really so *smooth and unbroken* as it looks.

"The microscope, in fact, would show you that this apparently smooth surface actually consists of row after row of ridges and furrows, and if you looked carefully, you would see little round dots extending in a line along the top of each ridge.

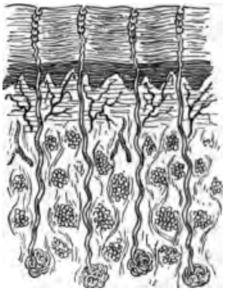


"As it would be very tedious to all of you to come up one by one and look through the microscope, I have prepared a drawing, which represents pretty accurately what is shown by that instrument.

"What do you think those round dots really are along the top of each ridge? They are little round holes in the skin; we call them the pores of the skin. It may help you in some slight degree to imagine how exceedingly small these holes must be, and how closely they must be set in the skin, if I tell you that in some parts of the body a shilling would cover no fewer than three thousand of them.

"And now, I daresay, you are curious to learn what these holes are, and what purpose they serve. I will tell you; but first let me give you another surprise. What will you say when I tell you that the skin which covers your body contains not less than three millions of these pores? Yet wonderful as it may seem, it is quite true.

"I have here another drawing, which will show you *what you would* see (of course with the help of the croscope again) if we were to cut down into the skin. ere is the hole on the surface of the skin, and one nce is sufficient to tell that is hole is simply the opening mouth of a little pipe, which nds about like a cork-screw.



“Let us trace this cork-screw pe downwards, and we find at at its lower extremity it rls itself up into a little ball. ou must remember that every e of those three million pores constructed on exactly the same plan, and that eans to say we have three millions of these pipes ening out on the surface of the skin, and rolled up to three million little balls at the inner extremity.

“I need scarcely say that the Great Architect of dwelling in which *we* live would not have supplied t dwelling with such a multitude of pipes without e all-wise purpose. But what do you think they ? They are the drain-pipes of the dwelling: their k is to carry off waste poisonous matter from the y, just as the drains and sewers carry off waste sonous matter from our houses.

“Now, I daresay, you will understand what I meant en I told you that you had nearly thirty miles of in-pipes in your body. It is calculated that if these ee million pipes could be stretched out and placed d to end they would form a line from twenty-eight thirty miles in length.

“You have, of course, all seen the perspiration or eat standing in little round beads on your skin, as result of unusual exertion. That perspiration is poured out from the three million little pipes which open on the surface of your skin. It is drained from the blood by the little rolled-up balls at the ends of those pipes.

"You may not know that this perspiration is always going on to some extent, for you do not notice it at ordinary times, because it passes away in the form of vapour almost as quickly as it is poured out. But as a matter of fact those drain-pipes never carry off less than a pint in the twenty-four hours, and this often increases to four pints when we work hard.

"Be careful to remember, too, that this perspiration is not pure water; it contains waste poisonous matter—amongst other things, little particles of the decaying substance of the body itself—and you know that decaying matter of every kind is poison. What a marvellous similarity there is between these drains and the house-drains we considered at our last meeting!

"Now let us go a little further. Picture to yourselves a person who goes on eating and drinking and working, day by day, and week by week, without giving a thought to these wonderful drains. Of course, the perspiration will continue to ooze through the pores, and pass away as vapour; but remember, it is only the watery part of it that can be changed into vapour. All the decaying solid matter which the water has washe out on the surface of the skin remains there, and wit the outside dust and dirt that is sure to settle on i forms an accumulation of filth, which sticks like varnis to the skin, and chokes up the outlets of the drai pipes as effectually as in the case of the house-drai under similar conditions.

"*Nothing of* course can stop the natural decay this waste matter which blocks the pipes, and the product of all decay is poison-vapour. As there is no outlet by which this poison-vapour can escape, it rushes back into the body by the only way open to it, just as we found it doing in the choked-up drains of the house, and filth fevers and other disorders are the result.

"Now that I have explained the case so fully, let us conclude with something practical. Never forget that as it is in the house, so also it is in the body. Free and open drains are essential to health. Therefore *wash! wash! wash!*

"Do not be guilty of that wretched hypocrisy, that sham, that delusion, of washing the face and the hands, and leaving the rest of the body to take care of itself. Ever keep in mind those three million drain-pipes, which the Great and Good Builder provided to make your dwelling comfortable and wholesome.

"It is the whole body that requires washing from head to foot, and that as frequently as it can be done. The best time for the bath is the morning, immediately on getting out of bed; but where this cannot always be done it is a good plan to have a warm bath with plenty of soap just before going to bed, and this should come at least once a week.

"My last word to you is, under any circumstances, *wash.* It is generally laziness that puts off the bath; but remember if you choose laziness and dirt rather than a little self-denial and cleanliness, you must expect ill-health and wretchedness, and probably disease and early death into the bargain. *Wash.*

Rule IV.—Cleanliness before all things

Lesson XVII

CLEAN CLOTHES, CLEAN BEDS, CLEAN HOMES

While the doctor paused for a few minutes to co sider what the next points of his discourse should l his listeners engaged in low-whispered conversations o with another. The adult part of his audience especial were filled with wonder at the thought of those thr million drain-pipes, for of course it was all new them. Which of them would ever have dreamed th the simple-looking skin which covers the body is nothi but a wonderful system of drainage containing thi miles of drain-pipes ?

Many firm resolves on the subject of perso cleanliness were made that evening, for the women sa "How can we expect to be healthy ourselves, or to ha healthy children, if we neglect these drain-pipes, a allow them to get choked up with dirt ?"

"Now my friends," said the doctor when at leng he resumed, "I have still one or two more thoughts give you in connection with the skin and its work. need scarcely say that the perspiration, with at le some portion of the decaying impurities which it co tains, must necessarily be soaked up by the und clothing, which is worn next to the skin. This bei the case, it is very clear that those garments m become dirty and unwholesome, as more and m of the impurities from the body soak into the Remember always that it is the poison-matter thin the body much more than the outside dirt and st which settle on it that works mischief. It would of very little use to wash the skin itself regularly, after the bath the same dirty contaminated underothing were put on. A frequent change of underothing is absolutely necessary to health; and the irty garments after being cleansed in the laundry, and weetened in the fresh air, are ready again to do duty hen required.

"This leads me," he continued, "to call attention to he bed-linen. We cover ourselves up snugly at night n the bed-clothes, and in a short time we are fast sleep. But you must not forget that even then the rain-pipes are at work, draining off impurities from he body.

"Indeed, the body covered up closely in bed, perspires even more freely than it does under ordinary circumstances in the day-time; and of course some of this perspiration with its poison impurities must soak into the sheets and blankets, so that, like the body-linen, they too become contaminated in time, and require to be frequently changed and washed.

"Fresh air will do much to sweeten the bed-linen from day to day, even before the regular time comes round for it to be sent to the wash. This explains why sensible people throw open the bedroom window as soon as they are up in the morning, and draw back the bed-clothes over the foot of the bed, so that both they and the bed itself may be left open to the purifying influence of the wind.

"Now last, but not least, the dwelling itself must claim some *notice* before we leave this subject of *leanliness.* I need not say that personal cleanliness, as regards the skin, the clothing, and even the bed-line would be of little use, unless the house itself and it surroundings were also kept clean.

" Be sure of one thing—there can be no such thing as health in a family where dirt is allowed to accumulate in and around the house. Dirt and diseas go together, if you like, for they are boon companions but dirt and health, never.

" Remember, too, that although dirt of every kin is bad, rotting, decaying dirt is worse than all, for fills the air with foul poison-vapours, which are bre from its decay.

"I cannot help thinking that it is a merciful provisio of Nature that poison-vapours of every sort, wherev they exist, taint the air with their offensive smell, an *in this way* give timely notice of their presence. The *remind* me of the deadly rattle-snake of the tropic the terror of all living creatures within its reach—one bite from its poison-fangs, like one puff of those poison-vapours in their worst form, is sufficient to strike the victim dead.

"Happily, however, for the creatures around, Nature has placed a number of loose bones in the tail of this venomous snake, which rattle one against another as it glides along, and so cannot avoid giving timely warning of its approach. It is just so with the poison-vapours. They, by their offensive smell, give timely warning of danger.

"The moment therefore you detect a bad smell in the house or its surroundings, follow it up, and never rest till you have traced it to its source, and scotched the deadly snake. If you are unable to trace it, do not on that account sit down, and leave things to take their chance. There is the local Inspector of Nuisances; go to him. It is his duty to find out the source of the danger and to have it removed.

"Very often, however, carelessness in the daily management is more to blame for bad smells than drains or anything else. If cabbage-leaves, fish-bones, potato-parings, and other waste matters, are thrown down in a heap near the house (whether in a dust-hole or anywhere else) and allowed to accumulate, their nature is to decay and rot away, and the product of all decay, let me repeat, is poison-vapour of some sort, which floats away into the air.

"Let all such waste substances be scrupulously burned from day to day, for burning is the only way to destroy their power for mischief; and let nothing but dry ashes be put into your dust-bins—*they are harmless, for they* cannot decay.

"Allow no dirty puddles, manure heaps, or hog-tu to be kept near the house, and see that all paved yar are frequently and regularly washed down.

"Be careful to keep a vigilant look-out over t sinks and drains in and near the house; and especia take care that the traps are never removed from t openings into the sink-pipes, for they are your protect against poison-vapours from the drains.

"Let the floors of all rooms and staircases washed and scrubbed as frequently as possible; a never allow waste slops to stand in either the bedro or the kitchen.

"Avoid the slovenly practice of hiding away di things under beds, or in dark cupboards, or other corners, in order to put on the appearance of be clean. Remember, *out of sight* is nearly always *ou* *mind* with such things, and they will most likely forgotten altogether, and left there to poison the around. Your aim must be not to *look* clean, but *be* clean; not to hide away dirt, but to hunt it out a get rid of it, because it is your deadly enemy.

"Above all, I would say to you, mothers, ne despair because your house is not so convenient your neighbour's. Good management will make best of a house which is ever so badly arranged. a tidy, earnest woman into a cottage with very l convenience, and she will, by her good managen and in spite of all difficulties, keep it neat and wh some. Her children will proclaim by their hea appearance that they come from a healthy h On the other hand, put a careless, drunken, d family, into a model cottage, and in spite of all *veniences, the* house and the family too will neve nything but a disgrace and a nuisance to all around hem.

“One last word before we leave the subject for ood. To be clean and feel clean is the greatest luxury f life, to say nothing of the advantages of cleanli-ess as regards our health. The clean man is proud f his healthy manhood—he holds his head up among is fellows; the clean woman is a charm, a comfort, nd a blessing to all around her.

“On the other hand, it is unfortunately too true, that when either men or women begin by neglecting cleanliness, they almost inevitably end with the ruin of themselves and those belonging to them.”

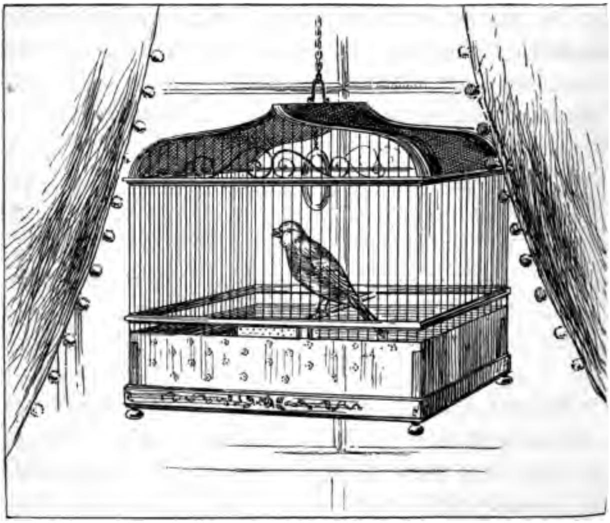
Rule V.—Sunshine is one of the Mainsprings of Health

Lesson XVIII

Light and Health

“What a nuisance that bird is, mother,” said Norah as she sat at her lessons one evening after tea. “I have got some very difficult problems to work, and I can’t possibly think while he is making such a noise”; and as she spoke she opened a drawer, took out a large dark-coloured apron, and pinned it up all over the canary’s cage. “There,” she added, as she sat down at the table once more, “he will be quiet now. I have seen Aunt Jane do that when her head has been bad, and she has not been able to bear the bird’s shrill song.”

“Yes, dear, you have indeed put an end to his merry song," said her mother; "but that dark apr has shut the sunshine out of his little life, that why he no longer sings. He cannot sing and l merry in the dark any more than you can. If y could see him now, you would not find him with h little head perked up as it was a few minutes ago, an his eyes like a pair of shining black beads—the ind of his bright, cheerful, happy spirit. The little fello



is dull and depressed in spirit now the light is gone he is in no humour for singing, I can tell you."

"But there," she added, "I think the doctor wil have something to say this evening about the influenc of daylight, so perhaps you had better get along wit your problems now, so that you may be ready to star with me at the proper time."

When they all met at the Institute an hour or two later, sure enough the doctor announced that the subject for consideration that evening would be " Light, and its influence on health."

"I need not tell you, my friends," he began, " what a joyful thing light is. You all have felt the cheering influence which bright sunshine has on your lives; you all have experienced the depressing effect of darkness and gloom. It seems as if light and happiness must go hand in hand together—that the one cannot exist without the other.

"Happiness, you know, is simply a condition of the mind, the temperament, the disposition; but it is a well-known fact that the mind exercises a marvellous influence over the body—that whatever makes us happy and cheerful in mind, helps to make us and keep us healthy in body. Light is one of those things, and it is certainly not the least important of them. It acts upon the body through the mind, although no one has yet been able to say with certainty what is the precise connection between the two.

"You know that when you feel bright and cheerful you can work harder, eat better, and, in short, enjoy life more than when you are dull and low-spirited. More than that, I can safely say that in many cases bright, cheerful, hopeful spirit will do more than he doctor's medicines to raise the patient from a ick bed.

"But perhaps stranger than all is the fact, that not only does the mind act upon the body, but the body in its turn reacts on the mind; for every one knows that when the body is in ill-health, the spirits naturally become dull and depressed, and when the body is healthy and strong, the mind and spirits are clear, bright, and cheerful.

" Therefore, as light exercises such a powerful influence on the mind and spirits, and through them on the health of the body, we should take care to live as much as possible in the light.

" But besides its influence on and through the mind, light has also a direct influence for good on the body itself, and in this respect human beings are very much like plants.

" Take one of your sturdy plants out of the window, where it now stands spreading out its green leaves and beautiful blossoms towards the light, and place it in a dark cellar, and in a short time you will find it weedy-looking and of a pale sickly hue, with not a flower on it.

" The fact is, sunlight is absolutely necessary to enable plants to extract from the carbonic acid of the air the carbon, which they require for their support. Shut up in that dark cellar your plant would lose this part of its natural food, and its sap would become thin and watery, and unfit to nourish it.

" It is just the same with human beings. Those who live in the dark are pale and sickly. Their blood is poor and pale coloured. They are liable to all sorts of diseases both of body and mind. Their bodies seldom grow to the right size—they are stunted and puny, and often deformed; and their minds do not grow properly either, for they are apt to be weak, silly, and even idiotic; and they grow old long before their time.

" Go into some of the poor, densely-packed quarters of London, and most of our other large towns, and note the pale, weary, hopeless faces of the people you meet with there, for they will tell their own tale. Follow the poor creatures to their homes, and you will find that, in all probability, they live in some dark underground room, or else in a gloomy narrow court or alley, where *the sun can never shine.*

evil, and neutralise good wherever it seeks to
ish a footing among these neglected classes.
and disease of every kind prevail; a poor
rd of physical strength, the result of the fœtid
phere they inhale by day and night, and of the
y darkness of the dens they inhabit, deprives
of the power to do able-bodied work, while loss
rgy and depression of spirits drive them to seek
d support in vice and intoxication.'
emember, it is your duty to get as much of God's
sunlight as you possibly can. In your rooms
ne do your best to tempt the sun to look in, by
s keeping the windows clean and bright. If
windows are small, as they generally are in old
, do not add to the darkness of your rooms by
g thick curtains over them, but keep them as
s possible for the admission of every ray of sun-
that falls upon them. Thick curtains should
e used in rooms with large windows, where so
light enters, that you can afford to spare a little

will now close my remarks on this important
t by recommending to your careful study an old
n proverb, which says, '*If you keep the sun out
ur dwelling you will quickly have to admit the*
.' But, bear in mind, the doctor cannot do what
n can do; his medicine, after all, has no virtues
hose of the blessed sunshine."

Rule VI.—The Body needs Exercise

Lesson XIX

EXERCISE AND HEALTH

"I want you this evening to consider the body once more as a sort of living engine," began the doctor. "We have seen that, like an ordinary steam-engine, it must be treated well, if we wish it to work well. There are certain clearly-defined rules for feeding it and keeping it in order, and these rules or laws cannot be violated without impairing the usefulness of the engine itself.

"Now if I had a steam-engine, and chose to lay it up for twelve months, without once lighting its furnace fires to set it to work, it would take no harm from its inactivity, provided I kept it clean and properly oiled. I could at any moment, by putting a match to the fuel in the grate, start the fires, and set the water boiling in the boiler, and the engine would then work as well as ever it did.

"With our living engine the case is very different. We may carry out, as carefully as we possibly can, all those rules of health with which we are now so familiar, but if we keep the body in a state of inactivity it will certainly grow weak, and fall into ill-health, in spite of everything.

"Good food and wholesome drink, fresh air, and light in abundance, perfect cleanliness and the best of clothing would be of little avail, if we were at the same time compelled to sit in one position all day, and day after day. Plenty of exercise is absolutely necessary to keep these beautifully-formed engines of ours in proper working order.

"It is important to remember, too, that the finest steam-engine ever made is sure to wear away gradually with its work, and in time it will be valueless except as old iron. On the other hand, the most curious fact in connection with our living engine is that it wastes away, not with work but with idleness. The more it is worked, the more vigorous it becomes; but if the body, or any part of it, is not worked, it gets so weak and helpless, that at length it seems to have very little power to move at all.

"Think of the familiar lines, which every one knows by heart:—

> The smith, a mighty man is he,
> With large and sinewy hands;
> And the muscles of his brawny arms
> Are strong as iron bands.

"What is it which gives the man those strong muscular arms? We need not ask; it is, of course, his regular work day by day at the forge. That work which wears out the tools he uses, actually does his muscles good.

"But suppose the poor fellow were unfortunate enough to meet with an accident, and break his arm or his collar-bone. That would necessitate strapping one of those brawny arms up close to his breast, in order to keep the injured bone in one position, and so give it a chance to set. There would be nothing wrong with the arm itself remember, and yet what a contrast it would present to the other one, when at the end of perhaps two months it was unstrapped and set free. It would be a mere ghost of the other to look at, and so far as strength is concerned, it would be altogether powerless to wield the hammer in the old accustomed way. The reason is clear: the arm during those two months would get thinner and thinner, weaker and weaker, because of its enforced inactivity. By gradually using the limb, a little at first, a little more the next day, and so on, the man would in time get back the full use of it, and it would increase in size till it became as big as the other once more, but this improvement could only come by exercising the arm.

"*The erect*, well-knit, muscular frame of the trained *soldier is the* result, not of feeding, fresh air, and eanliness altogether, but of a regular systematic urse of drill, which develops his muscles in every rection. You would never recognise in that smart, ell-set-up, supple figure, the raw, slouching, country uth, who took the Queen's shilling some twelve onths before.

"In those days he probably fed as well as he does

ow, and he certainly had no lack of fresh air in the pen country where he lived. His work, however, xercised only a part of his muscles, not the whole of hem in turn, and he slouched about in a sort of unalanced way then, because some of his muscles were ess firm and reliable than others.

"It is very much the same with almost everybody. Ve *all get a certain* amount of work day by day; some may get too much, some not enough, but few of us get exactly the right sort to exercise our muscles all round.

"Those who work in factories, for example, confine themselves to their own particular branch of the work to be done, and although this makes them very dexterous and skilful workers, it as a rule exercises only a certain few of their muscles, more or less as the case may be, and the rest are comparatively idle.

"Such work, therefore, provides only one-sided exercise for the body; it exercises part of it, and not the whole. Hence it becomes necessary for all of us, old and young, to take some sort of systematic open air exercise every day of our lives.

"I have already stated the fact that muscles increase in substance and power by action, and waste away and grow weak by inaction; but it is time now to go a step farther than this, and notice the changes that take place in a muscle during and after exertion.

"The first effect of exercise on any muscle is, as you know, to wear away and break down a certain part of its substance, more or less according to the nature of work done. This worn-out substance is henceforth dead, decaying, waste matter, which must be got rid of and carried out of the system entirely, because, like all other decaying organic matter, it would be capable of infinite mischief if left in it.

"The solid waste matter cannot be removed in that state. It requires oxygen to burn it up where it lies, and when this is done the products of the burning can be readily absorbed into the blood, and washed away in its stream, as it flows along.

"I need scarcely remind you that, while we are undergoing exercise of any kind, our breathing becomes more rapid, and the heart too quickens its pace; we are conscious of increased warmth all over the body, and our glowing cheeks tell how much more fiercely the blood is surging through the arteries and veins. But what does all this mean?

"It is nothing but the effort, which Nature is making to get rid of the worn-out, waste matter as quickly as it is formed. The increase in the rate and depth of breathing supplies the blood (it is estimated) with about four and a half times the amount of oxygen, which is taken in at ordinary times; and the quickened pulsation of the heart sends this blood through the body at a very much increased speed. Wherever the oxygen meets with worn-out matter, it seizes upon it and burns it up, and this of course accounts for the increased heat; while the rapidly-flowing stream sweeps away in its course, and so carries out of the body, all the products of the burning.

"But even then we have only told half the story. The very stream, which provides in this wonderful way for the removal of the waste, comes laden with nutritive matter from the digested food, for the express purpose of building up again at once that which has been destroyed. Nor is that all; the body at such times makes so great a demand upon the blood for nutritive matter to do this repairing work, that the blood itself becomes impoverished for the time, and the necessity for replenishing it arises. In other words, an increased desire for food springs up—the appetite is improved. Hence you see exercise makes us stronger *and better in every* way."

Rule VI.—The Body needs Exercise

Lesson XX

More about Exercise

"I think I have now made it clear to all of you," resumed the doctor after a few minutes' pause, "that the result of exercise must be to make the muscles bigger and healthier, hardier and more capable of work, than they would be without it. The next thing I wish to show is, that the good effects of exercise do not by any means end with the muscles.

"In the first place, the vigorous breathing which is always the necessary accompaniment of vigorous muscular action, enlarges the chest, and so gives the lungs more room for work; while the lungs themselves, like the muscles of the body, increase in size and power, as a consequence of their work, and it is needless to say, the bigger and stronger the lungs are, the more air they are able to breathe in.

"More air, of course, means more oxygen, more rapid burning up of the waste, more warmth for the body as a whole. Indeed, it cannot be too carefully borne in mind that strong, healthy lungs go a very long way towards promoting the general health and comfort of the body.

"Nothing is so good and effective as plenty of open air exercise for developing sound, strong, healthy lungs.

"Then again, another result of exercise is an *increased flow* in the current of the circulation, and this *carries the* warm blood much more rapidly than usual through every part of the body, so that the heat is equally distributed everywhere.

"Who has not experienced the pleasurable glow of warmth in the feet and lower extremities, produced by a brisk walk on a cold day in winter? Perhaps you may have been sitting still for an hour or two, and the blood all this time has been moving sluggishly along; more heat in fact has been passing away from those lower extremities than the slow-moving blood can bring to them, and hence the feet and legs have become chilled with cold. A good swinging walk soon sends the blood surging down into them, and they then begin to tingle with the sensation of warmth.

"Again, everybody knows that the skin is thrown into more vigorous action during and after muscular exercise. The body then perspires much more freely than at ordinary times, and the reason is easy to tell.

"The rapid increase in the burning up of the worn-out substance of the body loads the blood with an unusual amount of poisonous waste, and the healthy body, remember, never keeps waste matter of any kind longer than it can help.

"Hence it is that those thirty miles of drain-pipes all over the skin (the sweat glands) at once begin to suck away from the blood, as it rushes along, as much as they can of those impurities, and pour them out, in the form of perspiration or sweat, over the surface of the skin.

"I need not remind you that anything, which helps to maintain the vigorous action of the skin, must be a powerful aid to health; so that, in this respect again, exercise improves the bodily health.

"*I have already* shown you too that, when the blood courses through the body, as the result of muscular exercise, it has other work to do besides that of getting rid of the waste. It flows along laden with nutritive matter from the food, which it is constantly giving up, to make good that waste.

"Deprived of its substance in this way throughout every part of its course, the blood itself needs to be renewed. More food must be digested and poured into its stream, and thus a greater demand is made upon the stomach and the other organs of digestion than usual.

"Remember, in the healthy body, it is the same with these organs as with the rest. Increased demands upon them result in increased vigour, for they too are nourished and supported in their work by the very blood which they help to make.

"Suitable, outdoor exercise, in short, does more than anything else to promote a healthy digestion, just as a slothful, indolent life is the sure precursor of indigestion and all its attendant evils.

"The most troublesome organ in connection with the digestive system is the liver, and nearly all its troubles, except those which result from alcoholic intemperance, may be traced to the want of suitable and sufficient exercise. A sluggish liver, with its usual accompaniments of constipation of the bowels, headache, a sense of oppression and languor, and a general disinclination for exertion, has no surer remedy than a course of regular, systematic, open air exercise.

"Now lastly, let me point out that the muscles of the limbs and body, which we call into play with every *sort of bodily* exercise, are all under the control of the *Will.* *We* move our arms and legs, our fingers and toes, our head and body, that is to say, according to our own Will and Pleasure. The Will commands; the Muscles obey. For this reason they are called *Voluntary Muscles*, because they act in obedience to the *Will*.

"The Will, as you are already aware, is a power lodged in the brain; it issues its commands, and telegraphs them onward to the muscles, by means of nerve-fibres, which stretch from the brain into the remotest parts of the body.

"It is a very curious fact that just as a muscle, or a set of muscles, will waste away and become thin, flabby, and weak for want of use; so also, and at the same time, the nerve-centres of the brain, which control those muscles, gradually lose their power over them. On the other hand, wherever any set of muscles are regularly and systematically exercised, we find daily increasing proficiency in the work to be done, showing plainly enough that the nerve-centre is getting a firmer control over them because they are exercised.

"Thus, there is no other way for a person to become proficient in the art of music, except by commencing regular, daily practices as a child. Trained in this way, the nerve-centres never lose their grip on the muscles of the fingers, but instead of that, their power of effective control increases more and more, as they are exercised from day to day. A person, who takes up music in adult life, rarely if ever attains to anything approaching proficiency, because practice as he may, the nerve-centres cannot regain the control over the muscles which they have lost.

"This is equally true of almost everything of a like nature; and it explains why children so readily learn *to do many things*, which their elders can only faintly imitate at a distance. Cricketers, footballers, swimmers, runners are made as boys; they would never rise to any eminence in either, if they left it till adult age.

"All this goes to prove then that exercise is not simply a means of developing firm solid muscles, instead of thin flabby ones. Properly carried out it affects the entire well-being of the individual, for it involves training for the mind as well as the body."

Rule VI.—The Body needs Exercise

Lesson XXI

SUITABLE AND SUFFICIENT EXERCISE

"Poor lad!" whispered the women to each other, as they stood in little groups, watching a sad funeral procession move slowly along the road. "What a pity to see such a promising young fellow cut off on the very threshold of his manhood! What a terrible blow it must have been to his poor mother!"

No one had been better known in the town, or was more popular, especially among the youthful part of the community, than Frank Lockyer, a fine, strapping lad of twenty or thereabouts, who was always a prominent figure in the cricket and football field. He had during the last year or two taken to bicycle riding, and had carried off prize after prize on the racing track, adding thereby very considerably to his popularity. Yet this was the lad who was now being carried to his last home, and the event seemed to have cast a gloom on everybody, old and young alike.

A lad of such fine physique as his certainly gave no cause for suspicion or alarm as regards his bodily health, nor had there been any cause till quite recently. His very popularity, poor fellow, and the intense strain of trying to beat everybody, and everything that had ever been done, had brought him to an early grave.

Almost without any warning, and to the consternation of all who knew him, he broke down after one of those races, and a painful and trying illness was the result. Indeed, he never properly rallied; Dr Thornhill pronounced him to be in galloping consumption; and he lingered on for a few months, till at last the end came.

On the evening of the funeral the doctor's class met as usual at the Institute, to listen to his further remarks on the subject of Exercise and its influence on Health.

"Poor Frank Lockyer," he commenced, "I know you are all thinking of him still. Let us endeavour his evening to turn his sad end into a useful and rofitable lesson for ourselves and those around us. I ave already been at some pains to point out to you hat exercise is a most beneficial aid to sound robust ealth, and yet I deliberately say now that it was ercise, and nothing else, which brought that poor lad his early grave. How can both these things be ssible? Let us see.

"You might be apt to think, after all I have said, at as exercise is such a good thing for our health, could not have too much of it. This is the mistake, ich too many people—and more particularly young ople—make. Our poor young friend made this very istake, and has paid the penalty.

"*Exercise should* in no case be continued when there is a feeling of fatigue and over-exertion. This is Nature's hint that the body has had enough for the present. Take the hint, and stop at once; for after that all exercise is excessive, and becomes a positive strain on the heart, the lungs, and the blood-vessels.

"The heart itself, which in the ordinary way carries on its pumping work, without much consciousness of it on our part, becomes stimulated by exercise, and up to a certain point this does good. But when it begins to thump in an uncomfortable way against the ribs stop the exercise, whatever it may be, or the result is likely to be a collapse of some sort. The reason of the thumping is, that the heart is straining every effort to force more and more blood through the body, and it is more than probable that, if this continues for long, some vessel, stretched to its uttermost and unable to bear the strain, will burst. When this happens to a vessel in the delicate structures of the lung, it is almost always a sure precursor of active disease.

"The keen desire to excel in athletic sports has led many a young man to continue the strain in defiance of Nature's warning, and whenever this is the case exercise becomes a curse instead of a blessing. It is in fact another case of abusing, instead of using, what is intended for our good.

"I should like to point out to you that our military and naval authorities, whose business it is to train and develop the nerve and muscle of the soldier and th sailor, do not attempt the task by imposing any excessive strain on the men, but by a regular system of daily drill, which shall exercise every part of th body in proportion to its needs.

"Still, in spite of all I have said as to the danger of exercise when it is taken in excess, I must repeat that the evils arising from the want of it are equally as great. The child, who is deprived of healthy outdoor games, develops (if one can call it development) into a stunted, puny youth, weak-chested and weak-limbed, with soft flabby muscles, unable to bear the strain of any sustained effort whether in work or play. His pale, pasty face and his imperfectly nourished body tell of a bad digestion, and a want of vigour in the circulation; and, in addition to all this, he is generally nervous and awkward, and as defective in mental power, as he is in muscle. In his case there is no such thing as *a sound mind in a sound body*, and, without that, good work of any kind is impossible.

"What a contrast he presents to the lad who has spent some of his spare time, day by day, since childhood, in open air games. One glance at his cheery face, beaming with the ruddy glow of health, one look into his bright fearless eyes, one grip of his arm, and we say with pride, 'These are the lads to make the men of the future.'

"And now I have something of the utmost importance to say to you mothers. Why should it be considered out of place, and wrong (as it too often is) for your girls to romp and play? They have muscles to develop, and machinery to keep in working order, just as your boys have. Why deny them the means of doing it?

"If girls are left to their own healthy instincts, with no further restraint than that which their natural feminine modesty imposes, there need be little fear that they will develop into rough, boisterous hoydens. Yet this very fear it is, and nothing else, that prescribes for *our girls in too* many cases a prim, sedate walk, instead of the healthy games of childhood, and sternly represses in them the least disposition to romp, on the ground that it is unladylike.

"Mothers are often much to blame in this respect.

They dress their girls in colours and materials altogether unfit to bear any rough usage, and this alone in itself is sufficient to put a severe restraint on their natural freedom. To keep themselves prim, and avoid *soiling their* clean frock, they must of necessity repress *all desire for play.*

“The old Greeks of two thousand years ago could certainly teach you a lesson in this matter, for the perfectly developed figures of their girls and women—those figures which sculptors of all ages have loved to imitate—were built up by daily, unrestricted exercise in the open air. Narrow, pinched chests, spinal curvature, and other deformities now unhappily too common among girls, would soon disappear from our midst if the same unrestrained freedom were allowed to them as to boys.

“Therefore, I say, do not deny to your girls their daily romps and games in the open air, or you can never expect them to grow up healthy, well-developed women. The skipping-rope and the hoop are quite as essential in their place as books and knitting.”

Rule VI.—The Body needs Exercise

Lesson XXII

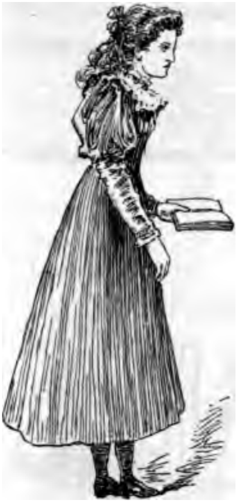
KINDS OF EXERCISE

“Speaking of skipping-ropes and hoops,” continued *the doctor, “reminds* me that it may now be advisable to glance at the different forms in which exercise may be taken, and note the special advantages of each.

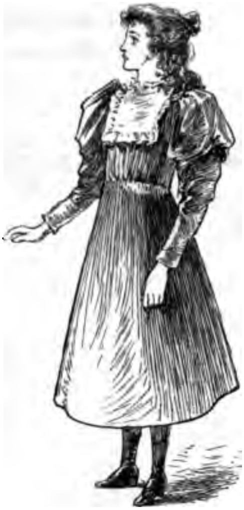
"Let me begin by reminding you that there is a mental as well as a muscular side to all exercise. You have only to watch a group of children at play, and you will readily understand my meaning. See how they throw their whole heart and soul into their sports: there is not freedom of movement merely, but every sense, as well as every muscle, is given up to the enjoyment of the play-time. This should be the key-note of all exercise with young and old; it should provide pleasurable relaxation for the mind, side by side with suitable and sufficient work for the muscles.

"It shows too the fallacy of substituting mechanical drill, or calisthenic exercises of any sort, in place of the *natural games* of childhood. It is a false system of *education* altogether, which imposes for the sake of decorum, an unnatural, stiff sedateness upon children, and then tries to make up for it by artificial drill, because after all they have no heart in it.

"Among all the forms of exercise there are none which bring into play so many muscles as the simple



UNGRACEFUL CARRIAGE.



GRACEFUL CARRIAGE.

one of *walking*, but you must distinctly understand what I mean by *walking*. The head should be held erect, the shoulders back, the chest forward, and the arms should be allowed to hang loosely and gracefully at the side. Easy graceful carriage, or good deportment as we sometimes call it, is of more importance to a girl's personal appearance than a pretty face would be without it.

"*But it has* a greater influence on her health even than on her personal appearance. In a person, who from childhood has acquired the habit of carrying the body erect, there need be no fear of round shoulders, and a contracted chest, with all the attendant evils of undue pressure upon the internal organs, which must naturally follow when the lower ribs are forced into the body by a stooping, lounging habit.

"I should like to remind you here that a regular daily walk of three or four miles is even more essential for women than for men. The man's business as a rule takes him out, whereas the woman's duties confine her more closely to the house, except perhaps when she has to leave it on some shopping expedition. Even these occasions, however, may be few and far between, and so it often happens that (unless she forms *a habit of* going out somewhere every day) she is tied *to the house* for days together.

"Now lastly as regards the walking itself; let it be walk, not an aimless sauntering through the streets, t a hurried rush as if the only desire was to get it er, but a good healthy swinging step, such as can easily sustained without undue exertion or fatigue.

"Running (of course within proper limits) is another m of exercise, from which healthy girls as well as boys y derive considerable benefit, for it not only provides rk for the muscles of the body and limbs, but also nulates the heart to more vigorous action, and pands the lungs with the fuller, deeper breathing ich accompanies it. Running is not good for girls o are approaching womanhood.

"The various outdoor games, such as cricket and tball, lawn-tennis and golf, all involve more or less ning; *croquet* is a quieter game requiring less exertion. Each one provides a useful form of exercise, because considerable skill is necessary on the part of the player, and this skill is only to be acquired by the mind acting in unison with the muscles.

"Football of course is, from its very nature, restricted to the rougher sex, and even among them it should be still further restricted to those of robust constitution. It often happens that, when young men take up this sport without due regard to their health, and put themselves against others of more robust build, the overstrain becomes too much for their strength and endurance, and the result is a collapse like that of poor Frank Lockyer.

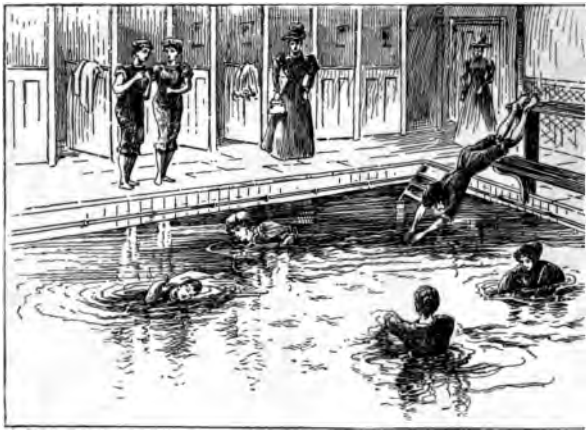
"*Bicycling and Tricycling* are quite a modern form of exercise, and have become during the last few years very popular with all classes of people, young and old of both sexes. The great advantage is that it takes one out into the open air; and while the constant

›f scene affords food and recreation for the very large number of the muscles of the body ·ely those of the legs) are brought into play.

er, however, that while riding for exercise and must be a boon and a blessing to thousands, t racing-speed can only be undertaken in of Nature's laws, and Nature will one day *revenge.*

"Horse-riding is one of the most invigorating fc of exercise, but as this is naturally confined to wea people, we need not discuss it here; and the s might be said with almost equal truth of rowing.

"Swimming, thanks to the developments of the few years, is now within the reach of all. There few towns of any size to-day, which cannot boast t public swimming-baths, and in all of them the arra ments as to time are such, that the advantages are



to both sexes. Of all forms of exercise none is healthful, more invigorating, or more useful this.

"I think before closing this subject I must you clearly understand that what I said just now a drill and calisthenics, was not meant to undervalue t I wished then to point out the fallacy of forcing *on the child* as a substitute for its natural play; *was all.*

"A well-thought-out system of daily drill is most invaluable to the child's development, because its purpose is to bring, as near as possible, every muscle of the body equally into play."

Rule VII.—The Body requires its regular periods of Rest

Lesson XXIII

RECREATION AND REST

So pleasant and so very profitable had these veekly meetings at the Institute been, that everybody vas really sorry when the doctor announced that he ad but one more lecture to complete the course.

"The last of our Rules of Health," he began, "deals with the necessity of *Rest* from time to time. Rest then, is to be the subject of our discourse this evening.

"I have spoken at some length on the subject of work and play, but play after all is only another form of work. It rests us, and does us good in mind and body to go from one kind of occupation to another. Anything which takes us away for a time from our ordinary work, and which in itself affords us pleasure and amusement, refreshes us and sends us back to that work with renewed vigour. The fact is, our energies are diverted into a new channel, and this gives the body much more effectual rest than it could get from idleness.

"This change of occupation, whatever it may be, we call recreation, because it seems to recreate, or build up afresh our jaded faculties and powers. Everybody, not only children, but their elders as well, work better and feel better after a short break for recreation.

"Recreation may take various forms. In one case the best recreation, as I have already explained, may be games, sports and exercise of some kind in the open air; but this would scarcely be the kind of change which I myself should choose if I had spent the day digging in my garden; nor would it be refreshing to a man, who had been working at the carpenter's bench all day.

"The best recreation of all at such time would be a book. Reading is a sort of exercise, but it is exercise in which we use the eyes and brain, not the *muscles.* The mind derives profit and pleasure from *this exercise,* and meantime the muscles wearied with walking, digging, or hammering, can take their rest. It is a complete change of occupation.

"Before I pass on, I should like to give you all, and especially my young friends, a word of sound advice about books and reading. Do your best to cultivate early in life the habit of reading, and bear in mind that good books will always provide you with

ompanionship and solace, as well as amusement and un. To those who are fond of reading, books become perfect treasury of happiness. They are wise teachers nd staunch friends; they fill the mind with beautiful houghts and rich stores of useful information; they an cheer you in your times of dulness, and rouse the nerry laugh once more, when nothing else can.

" So much then for reading as a recreation. There is *ne other sort of* recreation, which is always a healthy one provided that, like everything else, it is used in moderation, and not allowed to interfere with one's regular duties. I refer to the hobbies of various kinds, which people take up to suit their individual tastes. A hobby of some sort must as I say be a healthy

recreation, because it gives the individual something to interest and occupy his spare time. The danger sometimes is that it is apt to become very fascinating, and it requires some effort of will to prevent it from engrossing thought and energy, that should rightly be given to the daily work.

“ Among the hobbies which different people choose a pastime are gardening, photography, drawing and nting, study, carpentry, dressmaking, and the rearing l keeping of domestic pets. A person who fixes on some such occupation for the spare hours, has no ie to get into mischief, and, on the contrary, is likely find in his hobby itself a healthy spur to work.

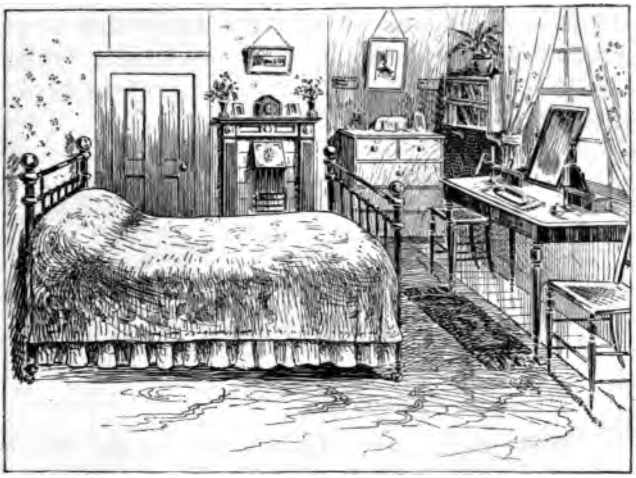
“The jaded brain-worker, in a word, recreates l refreshes his powers by providing exercise of some t for his muscles; the manual labourer wearied with physical exertions, seeks his rest and recreation in ook. But there comes a time at last, when mind l body too seem to give in; neither of them is able of further strain either in work or play—we l tired all over. Complete rest becomes a necessity *both mind and* body, and the rest comes to us, as every one knows, quite naturally and without our seeking it.

"Sleep closes our eyelids at night; we lie still and motionless with the exception of the beating of the heart, and the regular rising and falling of the chest in breathing; we are oblivious to everything around us. Yet this wonderful sleep (which by the by not even the wisest people can fully understand) restores and refreshes us as nothing else could, and we rise like new people in the morning.

"Regular sleep is so essential to health, that we cannot lose a night's rest without feeling the effects of it for days after, although the actual amount of sleep required varies according to age. Young babies can scarcely have too much sleep—the more they sleep the faster they grow, and although the amount gradually diminishes year by year, it is in the highest degree essential to secure for all children a full night's rest, if they are expected to grow up healthy and strong. A child that is allowed to remain up till the late hours of the night, soon begins to show, by its pale cheeks and general listlessness during the day, how much its system is losing through the want of sufficient sleep. For people of adult age, not less than seven or eight hours out of the twenty-four should always be spent in sleep.

"As sleep then is so essentially Nature's great restorer, it is our duty to use every effort to woo it. Children, if they are healthy and strong, have no trouble in this direction. Their head is no sooner on the pillow, as a rule, than they naturally fall off into a sound sleep; but it is not always so with their elders, *although I* am fain to say that the fault is more often *of their own* seeking than otherwise.

"Some people make a practice of eating a heavy meal just before going to bed, and then they wonder why they rise in the morning heavy and altogether unrefreshed. The reason is, they force a heavy task upon their digestive organs at the very worst time—at a time when the whole system is crying out for rest, and a heavy restless sleep with bad dreams is almost sure to be the result.



"Some people, again, overwork themselves during the day to such an extent, that they are thoroughly worn out when night comes, and are really too tired to be able to settle down to sleep. Work, as well as play, should always be stopped short, before this feeling of over-fatigue comes on.

"Some people, again (and this time I am specially addressing the wives and mothers), spoil their sleep by *careless neglect in* the arrangement of the bed itself

If we wish our sleep to be pure and refreshing, we must see that our beds are kept pure and sweet. Those who hurry through the bed-making to get it all over early in the morning, because they want the room to look neat, forget that fresh air is essential, to thoroughly cleanse the bedding from the vapours and perspiration of the night.

"The beds should always be stripped, and the windows thrown open, on rising in the morning. This affords time for the bed and the bed-clothes to get a good airing, before the work of bed-making begins; but if it is neglected, we cannot expect to have a fresh, wholesome bed."

PART II.—INFANT MANAGEMENT

Lesson XXIV

THE BABY

"Well, girls," said Miss Brown, as she walked home from the Institute with Norah and her cousins, "I think we have all profited by listening to the doctor's lectures. He has made it very clear to everybody that if we wish to preserve our health, we must obey Nature's laws."

"What a grand thing it is for us girls to know these Laws of Health," replied Norah. "When we are grown-up women we shall not be likely, I think, to make the terrible mistakes some do."

"You can understand now at all events why people cannot fly in the face of Nature with impunity," added Miss Brown. "Some people live as if they were determined to defy Nature altogether, but there is always a sad day of reckoning for them."

"Yes," replied Norah, "the doctor says such folly will surely bring its own punishment sooner or later."

"Ah, my dear," said her mother, who had come up just in time to catch her last remark, "you remind me

that there is one other subject in which I feel a very keen interest indeed, and that is the management of the little ones.

"It is, no doubt, very important for those who are grown up to take precautions for the preservation of their own health; but I consider it is even more important still for mothers to lay the foundation of good, sound health in their children by sensible treatment during their helpless babyhood.

"I need scarcely say that the baby which is

skilfully and intelligently cared for during its early life is more likely to develop into a strong, robust child, and eventually into healthy manhood or womanhood, than one that is nursed in some ignorant, haphazard fashion. It is true, the care and trouble may at the time be greater, but the mother is more than repaid for it all when she proudly looks round on her healthy family of boys and girls.

"I feel so strongly on this subject that I intend to ask the doctor to follow up his lectures on the Laws of Health with some of his sound, practical advice as to the proper management of children, and more especially of young babies. I have no doubt that a few sensible hints from him would prove a great boon to many a young wife and mother, who often finds her little charge a source of anxiety, and has nothing to fall back upon but some traditional, rule-of-thumb treatment, which is usually more hurtful than beneficial to baby."

"Some useful hints of that nature would be an excellent thing for the girls as well as for the grown-up women," said Miss Brown. "All girls are naturally fond of babies, and, of course, they would not willingly hurt the dear little things; but, nevertheless, they are often very liable to cause them serious injury, simply for the want of knowing better.

"It is no uncommon thing, as everybody knows, for the eldest girl in the family to be left in sole charge of baby, perhaps for hours at a time, and she certainly ought to know how to treat it. Then, too, numbers of girls go out into situations as nursery-*maids, and* it is most important for them to know *how to deal* with their helpless little charges."

The result of this conversation was that the doctor was consulted, and he promised that "*Baby*" should be the subject of his next lecture. When the appointed time came, therefore, he commenced the lecture as follows:—

"I have been studying the Registrar General's Returns for 1896," he said, "and the saddest thing recorded there, to my mind, is the fact that of 527,929 deaths registered in England and Wales, no fewer than 135,487—that is, upwards of one-fourth of the whole—were those of infants less than a year old, and I am sorry to say the same sad story has to be told, with very little variation, year after year.

"Certainly some of these premature deaths are due to unavoidable causes, but it is very painful to know that by far the larger proportion of them might have been prevented. Think of the valuable little lives which are wasted and sacrificed in this way, year by year, simply owing to the mothers' want of knowing better. Diarrhœa, worms, teething troubles, fits or convulsions, and wasting sickness are among the chief causes of infantile death, and all these are mainly the result of improper feeding. Feeding, indeed, plays such an all-important part during the period of helpless infancy, that I intend to make it my starting-point in treating of infant management.

"Nature, of course, has provided the very best of all infant foods—in fact there is no real substitute for it, and the healthy mother, who nurses her baby in Nature's appointed way, sees the little thing grow and thrive, and finds that no other food of any kind is needed.

"*I may indeed go* further than this, and say that the purely milk-fed baby, even though it may have appeared weak and delicate at its birth, has a much greater chance of battling with its infantile ailments, and growing up into healthy childhood, than one which is brought up on other food. On the other hand, improper feeding will change the strongest and healthiest of babies into a weakling, and quickly bring it down to death's door.

"In fact it is only when the mother, either from ill-health or some other unfavourable circumstance, is unable to supply the baby with its proper nourishment that troubles begin; and the troubles come through the common mistake which people make in supposing that *food* and *nourishment* are the same thing.

"I have frequently reminded you that it is *not food in the stomach, but* FOOD IN THE BLOOD, which is able to nourish your body and give it strength, and this is equally true as regards the body of the little infant.

"The poor misguided mother, driven to her wits' end to find a substitute for Nature's food, which she herself cannot supply, often sees her baby pine away its little life before her very eyes, in pain and misery, and wonders why it all is. Truly, her mother's love increases with the sufferings of the little thing; she spares herself no trouble, but tends it with unremitting care day and night, and feeds it regularly too.

"What a pity it is she does not know that she is simply pouring into the little stomach food, which can never possibly be digested—that, in fact, her baby is *being absolutely* starved, day by day, with its stomach *full of food.* Yet so it is; and the poor mother is unknowingly sacrificing the precious little life which has been committed to her love and care."

Lesson XXV

FEEDING THE BABY

The doctor's last words produced a great impression on all his hearers, and especially on the girls. They looked at one another, and then at the doctor in expectation of what he had to say next. His purpose in making this short pause was thus fully accomplished, and he resumed his discourse.

"Whenever artificial feeding has to be resorted to, from any cause," he began, "it must always be considered a matter of grave and serious responsibility, and not one to be undertaken in a careless, haphazard way, for remember, the baby's health—nay, its very life—depends upon the care with which it is fed.

"This was not always properly understood, but Science has of late years stepped in, and shown us clearly enough that infant food of any kind, unless it is specially adapted to the little creature's feeble powers of digestion, is not only useless, but positively injurious.

"Its mother's milk is of course Nature's perfection of food, and whenever it is deprived of that, it must be supplied with some substitute as nearly like it as possible, both as regards its characteristics and the nourishment it contains.

"Hence it is that in all artificial feeding, milk *either from the cow* or some other animal becomes an absolute necessity. It is the only natural substitute for what the child has lost, and all other things, such as gruel, arrowroot, corn-flour, sopped bread and biscuit, are not merely improper foods, but absolute poisons.

"You will perhaps think it strange why these things, which are such common household foods, and suit the rest of the family so well, should be injurious to the baby; but it is so. Let me explain this before I go any further.

"You are already aware that flour, oatmeal, arrowroot—indeed all farinaceous foods—consist largely of starch, and starch itself is useless as nourishment either for ourselves or infants. *It must be changed into sugar* before it can be digested, and it is the work of the saliva in the mouth to effect this change during the mastication of the food.

MOUTH SHOWING SALIVARY GLANDS.

"Now it is a curious fact that *the little newborn infant is not provided with saliva.* Milk is its natural food, and milk does not require saliva for its digestion. Hence it is that the glands, which prepare and pour out this fluid, are never fully formed till the child is about two years old. They make *their appearance* and begin to act in a feeble sort of *way about* the sixth month, when the four front teeth

he earliest of all—are cut; but it is not till the
hing is over, that these glands are able to provide
icient saliva, to properly digest starch food.

"Under these circumstances, therefore, it is clear
t there can be absolutely no nourishment at all for
infant in any of these farinaceous foods, because
e is no saliva in the mouth, and *without saliva the*
ch in these foods *cannot be digested.*

"The nurse or the mother who feeds baby on *nice,*
innocent-looking gruel, corn-flour, arrowroot, or any-
ıg of the kind, little thinks that she is actually starv-
it to death. The starchy matter goes into the tiny
nach, but the child is still hungry, because it gets no
rishment from it. Its cries are the cries of hunger,
ıough it has not the power to say so; and day by
it grows thinner and thinner in appearance, and
e and more feeble from this continued starvation.

'Nor is this all. The load of undigested starch in
little stomach and bowels acts like an irritant
ıon on the delicate membranes, causing diarrhœa
set in, through Nature's effort to expel the un-
ome substance from the system. Then, of course,
mother doses the little thing with physic to stop
diarrhœa, and the offending matter, instead of
ıg expelled, is left where it is to ferment, and so
t the baby body with pain, from wind, colic, and
r disorders.

"But in spite of all this, the poor misguided
her goes blindly on, when the next feeding-time
es round, endeavouring in all probability to soothe
little sufferer's pains with cordials, and little
ıning that she, and she alone, is responsible for all
orture.

"She attributes baby's ailments, its fretfulness, and its weakness, to teething, wind, worms, and all kinds of imaginary complaints, but she never thinks of blaming the food she gives it. She still perseveres (as she would say) in making the little thing take its food, for fear it should lose what small amount of strength it has. But the more she gives it, the more it suffers; and so matters grow worse and worse every day, till the end comes, and baby is laid to rest in its tiny coffin—its short, weary life of suffering over at last.

"Remember, sad as it is, this is no mere fancy picture, but a very common occurrence, wherever infants are fed on these improper starch foods.

"Milk is the only safe infant food, and as it is in the highest degree essential that the milk itself should be the best and purest to be obtained, I shall now proceed to give you a few hints for your future guidance.

"The most wholesome milk, of course, is that which is supplied by cows that feed on the open pasture-lands in the country; but much of the milk used in our large towns comes from stall-fed cows. This, owing to the close confined life which the animals live, is liable to acidity, and the acid is sure to disagree with baby.

"The milk may be easily tested by dipping a strip of blue litmus-paper into it. If it is at all acid, the blue paper instantly turns red, and the milk ought not to be used if there is any more to be got. Should there be none better at hand, however, the acidity may be corrected by adding to the milk a little lime-*water, or* a pinch of bi-carbonate of soda. This will *uickly turn* the reddened litmus-paper blue again, thus proving that the acidity is all gone, and the milk may then be given to the baby with safety.

"There is another danger in milk, against which I must now put you on your guard. Milk, as it stands, even in the pails in the milking-shed, or in the shop before it reaches the consumer, is very liable to absorb living germs or microbes, which float about in the air, and in this way it often becomes a vehicle for conveying infectious diseases.

"Luckily the heat of boiling is too much for these germs. *Every careful nurse or mother, therefore, boils the milk which is intended for the baby*, and thus makes sure of destroying them before they are able to work mischief. But remember, the milk must be boiled; mere scalding is not sufficient to kill these germs.

"After it is boiled, the milk should be poured into a spotlessly clean vessel, and stood in a basin of cold water to cool it as quickly as possible, and it should always be kept in a cool room till it is wanted. If treated in this way, it will keep much longer than fresh milk, and that is another advantage of boiling it; but be sure the vessel which holds it is perfectly clean, for *nothing makes milk go bad so quickly as dirt.*

"The last thing for us to consider now is the dilution of the milk. People are apt to forget that cow's milk is much denser than that which the baby would get naturally from its mother, and it is a very common mistake to give the milk too strong.

"It should at first be diluted with *three times the quantity of warm water;* then as baby gets stronger, *one part of milk* and *two of water* may be given; and *at six months it* may be increased to equal parts of *each;* but pure milk should never be given to a child under a year old.

"Lastly, the food should always be given at a uniform temperature of a little over blood-heat, that is to say, about 99 degrees; and this wherever possible should be tested by the thermometer."

Lesson XXVI

FURTHER HINTS ON BABY FEEDING

The doctor's remarks on the hurtfulness of farinaceous or starch foods left not a few of his hearers in a curious dilemma. In every grocer's shop they could see advertised various kinds of "*Farinaceous Foods for Infants*," and some of the mothers had actually used one or other of these foods with great success in feeding their babies.

What could it mean? Surely the doctor was not wrong, for he spoke so positively about the evils of these starch foods. They talked it over among themselves when they chanced to meet, but no one could throw any light upon the matter, and so the question remained unsolved.

Somehow or other it came to the doctor's ears, and at the next meeting he forestalled any possible questioning by going straight at the difficulty himself.

"I hear you don't feel comfortable about my strictures on the starch foods," he began. "Let me see if I can remove your doubts. First of all then, I will *begin by saying* that every one of these farinaceous foods *offered for* sale in the shops is prepared from flour of some sort, and flour consists, as you know, very largely of starch. In spite of this fact there may be nothing hurtful in any of them; on the contrary, they are as a rule wholesome and nutritious. How can this be?

"The fact is, the starch in them has been made to undergo a process of malting. The flour is mixed with malt meal, and then subjected to a certain amount of heat; and the heat sets up a sort of chemical change in the starch, which is actually converted, there and then, into sugar—*grape-sugar* we call it.

"This sugar, you know, is easily dissolved or digested, and hence any of these foods may be safely given to baby. This is not so with ordinary flour, oatmeal, arrowroot, or corn-flour. In them the starch remains starch, and in that state is absolutely indigestible for infants.

"Among the best known and most reliable of these malted farinaceous foods are Allen and Hanbury's, Mellin's, and Savory and Moore's. But in addition to these there is another class of farinaceous foods (such as Ridge's and Neave's) which are prepared not by malting but by subjecting wheaten flour to great heat. The heat itself converts most of the starch into sugar, but there is always a residue of unchanged starch left, and hence these foods are not so suitable for very young babies as the malted preparations.

"You may easily test any of these foods for yourselves. You have simply to mix a little of the food with hot water into a thin paste, then add a few drops of tincture of iodine to a table-spoonful of water, and pour some of this into the paste. If there is any unchanged starch present, the mixture will instantly *turn blue*.

"Unfortunately these prepared foods for infants are all too costly to come within the reach of the poorer part of the community, although a very good substitute for the unmalted kinds may be easily prepared by any mother in her own home.

"Nothing more is needed than to fill a small jar with ordinary wheaten flour, cover it up close, and bake it in the oven for several hours, stirring it from time to time to ensure its being well baked throughout. When the baking is over, the flour will be seen to have changed from white to a soft gray, and the greater part of its starch is now sugar.

"A little of this mixed with the milk, properly diluted, will make a very satisfactory food for an infant five or six months old, but it should not be given to younger babies.

"It is important to remember that none of these foods contain sufficient nourishment alone. Milk, after all, must be the staple food. Mixed with milk, they provide all that is needed, and in addition to that they actually aid in the digestion of the milk.

But to return to the milk itself; it is the curdy part of it which the little stomach finds a difficulty in digesting; and it is a good plan to add a tablespoonful of lime-water, or a little bi-carbonate of soda, to each bottle of food. This softens and breaks up the curd, and at the same time is useful in correcting any acidity, whether in the milk itself or in the bowels.

"The drawback is, that these things cannot be continued for long together, as the lime-water is liable to cause constipation, and the bi-carbonate of soda has a decidedly lowering effect on the system. A little barley-water is better than either. It does all that is required without any of these ill-effects; and it is easily made by adding an ounce of pearl barley to a quart of boiling water, and boiling it gently for half an hour. The barley should be well washed first in cold water, and the liquor itself should be carefully strained after the boiling."

At this point a question was asked as to the value of condensed milk as an infant food. Some of the mothers had tried it with excellent results, others were not so favourably disposed towards it. The doctor in reply said that, condensed milk makes an excellent substitute for fresh cow's milk, and if it is used judiciously, baby will thrive on it.

"But," he added, "there are two dangers in connection with its use which every mother ought to know. In the first place, remember that its very name *condensed milk* is quite sufficient to point out that it is much stronger and denser than ordinary milk. Hence there is great danger of interfering with the delicate digestion of an infant, if this milk is given too strong. For very young babies *one part of milk to twenty-four parts of water* will make the most suitable food, and the strength may be gradually increased as baby grows older.

"My next piece of advice is, that you should not rely entirely on condensed milk, nor continue its use too long. In its preparation so much sugar is added to it in order to preserve it, that, bulk for bulk, it is much less nutritious than fresh milk, and cannot therefore satisfactorily take the place of Nature's model as a permanent food.

"*Mothers find* that infants brought up entirely on condensed milk are not actually so strong as they look; they are flabby rather than plump, and not unfrequently their bones are weak and rickety.

"My advice, therefore, is, that you use condensed milk as a change, and not as a permanent food, and that you always use it in conjunction with some other food. Nestlé's and the Anglo-Swiss are the most reliable brands.

"Nestlé's Milk Food is another preparation, very useful for occasional or temporary feeding-purposes; but, like the condensed milk, it is not suitable as a permanent food. It is prepared from dried milk mixed with malted or baked flour. The curd of the milk is present in finely reduced form, which renders it easy of digestion, but much of the fatty cream is lost in the process of drying, and so on the whole the food is deficient in feeding value as compared with Nature's model."

Lesson XXVII

Baby Ailments

"I have from time to time glanced in a general sort of way at some of the evils which result from improper feeding," continued the doctor after a short pause. "I intend now to examine these baby ailments, one by one, and to give you in passing a few practical hints for dealing with each of them.

"A great and good man, in speaking once of the wholesale sacrifice of infant life, described it as '*The Massacre of the Innocents*,' and truly the description was not too severe, although, of course, ignorance and not culpable neglect or carelessness is, in the vast majority of cases, at the bottom of it all. Our only hope lies in giving to those, who are to be the future wives and mothers, a better training for the duties which will some day fall to their lot.

"One of the commonest of these baby troubles is *Indigestion;* but let me remind you that this evil is practically unknown, where the infant is nursed by its mother in Nature's appointed way, for it is always the result of improper food.

"Even when baby is fed on milk, it is possible to bring on an attack of indigestion by giving the milk too strong, or in the least degree sour, so that the ieavy curd is not easily broken up in the stomach. n such a case, however, the trouble may be easily emoved by giving the child a little anise water with pinch of bi-carbonate of soda in it. This will soften he curd, so as to render it easy of digestion, and there ill be no after effects.

"It is where the little thing is persistently fed on pped bread or biscuit, arrowroot, gruel, or corn-flour, iat the real trouble comes. Not only do these iings in themselves set up internal irritation, but iey afford no nutriment whatever, and the little ifferer, always ravenous with its stomach full of food, eedily swallows more and more, only to add to its rture.

"The distended stomach presses upon the heart id lungs, and other organs, and the result is seen in s irregular breathing, and in the sudden starts and ervous twitchings of the face and lips during its stless, feverish slumbers, from which it usually *ikes with a fit of* screaming.

"Sickness and vomiting are the usual accompaniments of all this suffering, and they relieve the little stomach for the time by bringing up wind and food; but the next meal only repeats the same course, and remember, all the time it is a case of sheer starvation, for which there is no help except in a change of food. The doctor can do nothing, so long as the mother will blindly and persistently go on with these indigestible things.

"Another very common disorder which arises from improper feeding is *Diarrhœa.* This indeed follows as a natural consequence of indigestion; for when the stomach is loaded up with a mass of undigested curd or starch, irritation of the bowels sets in, as Nature's effort to get rid of the offending matter, and this irritation gives rise to violent purging.

"If it ended here, the system would be relieved without any very great harm being done; but the same thing is repeated again and again after every meal, and this constant purging weakens the bowels, and at last sets up inflammation, which frequently proves fatal.

"One form of diarrhœa common among artificially-fed babies is so dangerous and deadly, and so rapid in its action, that it is known as *Infantile Cholera.* This is induced not so much by indigestible food as by unwholesome food, and there is nothing so likely to bring on the trouble as milk that has turned sour.

"Such food begins to ferment and putrefy as soon as it is taken into the stomach. This sets up violent irritation of the bowels, and inflammatory diarrhœa with vomiting as well as purging follows. The distress and exhaustion which result from all this are so terrible that, few infants can fight against it long; indeed even the finest and plumpest of babies will quickly waste and shrink to a mere shadow under such an incessant draining, and unless it is stopped, will rapidly sink and die.

"The best way to avoid the trouble is by taking care that baby has none but freshly prepared food, and that the food itself is made and kept in scrupulously clean vessels till it is required for use. *The feeding-bottle is very frequently the cause of much mischief.* See that it is absolutely clean and pure, for the least trace of sourness or decomposing matter left behind would quickly spoil all the food you put into it.

"Remember, *prevention is always better than cure,* and in this case it is far, far better. A little care on the part of the nurse or the mother will easily prevent what the doctor, with all his knowledge and experience, may not be able to cure.

"One of the most distressing sights to see is a child growing up with either bow-legs, or knocked-knees, a humped back, a twisted spine, or some such cruel deformity, especially when one remembers that the poor little sufferer owes it all to improper feeding during its infancy.

"These deformities are more often than not the results of a disease known as *Rickets,* and the disease rarely occurs except in infants that are artificially fed. Indeed, even among these, it is as a rule unknown if fresh, wholesome milk forms the daily food.

"It is fearfully prevalent in some form or other among the poorer families of our large towns, and the reason *is easily* understood. Good, wholesome milk in sufficient quantity to feed the baby is beyond their means, and the mother flies to the starchy foods because they are cheap.

"If these are given during early infancy, indigestion and diarrhœa will almost inevitably carry the baby off; but if a healthy child of six or seven months old is put upon starch food, it rapidly begins to develop signs of rickets. In a rickety baby the head is always unnaturally large, and the skull bones do not close up, because the food provides no material for their growth. For the same reason, the chest is generally contracted, the teeth are very late in making their appearance, and the whole of the bones are soft, and liable to twist into some sort of deformity. The joints, too, are loose and swollen, and the baby has no strength to crawl, or sometimes even to sit upright, till long after a healthy child is running about.

"Of course, before things reach this stage the doctor is usually consulted, and then the error in feeding is pointed out, the child is put upon a fresh diet, and every possible step is taken to undo the mischief. But it is then often too late, and this is why we meet with so many deformed men, women, and children from day to day.

"Among the many troubles and ailments of infancy few are more distressing to the mother or to the little

ferer itself than those connected with the teething
cess, and yet it is a well-known fact that a healthy,
lk-fed baby usually cuts its teeth, one after another,
thout any more trouble than a slight feverishness
a little extra fretfulness. It frequently happens,
leed, that the teeth make their appearance before
en the mother is aware of the fact.

"This is never the case with a baby that is im-
perly fed on starchy or other unsuitable foods.
ts or convulsions are then the usual accompaniment
the teething period, and these unnatural attacks are
her the result of worms, or of nervous disorder,
sed by irritation of the nerves of the intestines
ring the passage of the undigested food. Sensible,
tural feeding is the surest and safest preventive
inst teething troubles, as it is against every one of
baby's ailments.

"In a word, wherever artificial feeding becomes a
cessity, turn a deaf ear to those who would advise
use of any other food but milk. Milk is Nature's
del food for infants: it must be made the chief
instay for the first two years of their life, if they
to live and thrive, and grow up into healthy
ildhood."

Lesson XXVIII

HINTS FOR YOUNG NURSES

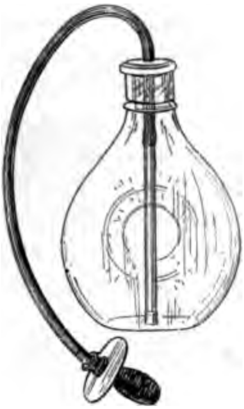
When the time for the next meeting at the In-
tute came round, every one was very much surprised
see Miss Brown at the lecturer's table instead of
e doctor.

"I am taking the doctor's place this evening," she explained, "because I want to give my young nurses here several useful hints for their future guidance in managing baby, should they at any time be left in charge of the dear little thing; and perhaps I cannot make a better commencement than by following up our good friend's advice, as regards baby's food, with a few words about the feeding-bottle, for the bottle certainly requires as much careful management as the food itself.

"Now after what the doctor has already said as to the necessity of perfect cleanliness in everything connected with baby's food and its preparation, you will not be surprised if I tell you that, a dirty feeding-bottle is one of the most dangerous of the many evils, which beset the hand-fed infant.

"Nevertheless, a dirty bottle is no uncommon thing. Indeed, I know from my own experience that a perfectly clean one is very seldom seen among the poorer classes. If you take up the bottle from the baby's crib, you will more often than not find that it smells quite sour. No further examination is necessary; you may be perfectly sure that a bottle with such a smell is far from clean. The foul, unwholesome smell is the result of carelessness and dirt, and food taken from a bottle in that state is little better than poison for the child. Let me explain why.

"If, just before the fresh food is put into it, the bottle is washed out in a careless, perfunctory, haphazard way, some small particles of the stale curd from the last meal are sure to be left behind, adhering *to the inside*. These at once begin to decompose and *ferment*, and the decomposition in them poisons the fresh food with putrefying matter, and so makes it a sure source of diarrhœa for the little one. I leave you to imagine what it must be when, in ignorance and gross carelessness, the bottle is filled up again and again with fresh food without any attempt to cleanse it. It is an undeniable fact that a very large proportion of the illnesses among babies are due to this, and this alone. *Absolute cleanliness in the feeding-bottle is one of the first essentials.*



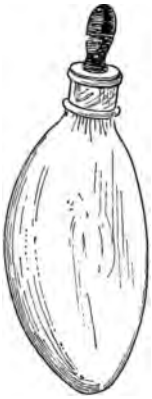
"Suppose we now examine the bottle itself. Among the many varieties of feeding-bottles, that in most common use is the one with a screw-down cap, an india-rubber tube, and a teat. It owes its popularity, without a doubt, to the fact that the busy nurse or mother has only to put baby into its cot, with the feeding-bottle beside it, and she feels free to go about her usual duties; whereas, with the boat-shaped bottle, which has simply the teat without any tube, baby must be held while it feeds.

"I shall have more to say on this matter presently, but just now we must confine our attention to the work of cleansing the bottle. The one thing to remember is, that whatever kind of feeding-bottle is used, cleanliness is everything if baby is to be kept safe from danger.

"There should always be two bottles, and these should be used in turn. After each meal the bottle should be well washed in warm water, with a little soda or borax dissolved in it, and special care should be taken to thoroughly cleanse the screw-neck, and the cap which fits it. The inside of the india-rubber tube should be carefully brushed out with a brush kept for the purpose; and the teat itself should be thoroughly cleansed inside and out. This done, bottle, teat, and tube should be placed in a basin of clean, cold water, and there left till they are wanted again.

“That will do for the bottle; now let us turn our attention to the feeding itself. You have learned that regular meals at stated intervals are better for all of us than indiscriminate feeding at all hours of the day, and it is just the same with baby. It should be fed regularly every two hours, and the bottle should be taken away for cleansing purposes when the meal is over.

“*It is very bad management to stick the bottle in the crib and leave it there.* Baby will soon finish its meal, and after that it will go on sucking at the teat from mere habit; but all the time it will be sucking away at an empty bottle, and filling its stomach with wind, which is sure to produce pain and discomfort later on.



“This explains why the boat-shaped bottle is more advisable (where the nurse has time to attend to baby’s meals) than the ordinary bottle with a tube and teat. She is compelled to hold both it and the baby during the meal, and as soon as the little one has taken enough, *she puts the* bottle aside.

“*I should* remind you that any of the food which is left in the bottle after the meal, must be thrown away. It should never be warmed up again, for it

would be sure to go sour before the next feeding-time. *A fresh supply of food, and a thoroughly clean bottle, hould be prepared for each meal.*"

Lesson XXIX

MORE HINTS FOR YOUNG NURSES

"I think we now clearly understand everything *onnected with* the feeding difficulty," continued Miss

Brown. "A baby that is properly fed ought to thrive and grow up into healthy childhood. But there are a few other matters of importance, to which I wish to call your careful attention.

"I need say nothing here on the subject of cleanliness and clothing. All that the doctor has said on these health essentials applies with equal force to baby as to ourselves, and perhaps more.

"A clean, wholesome baby is one of the loveliest pictures in any home; but there are few more pitiable sights than a dirty, neglected infant.

"Baby, to be healthy, *must have its bath* at least *once every day of its life,* and wherever it is possible it should be washed again, and well rubbed all over with the hand, just before its bed-time.

"Its clothing, which should be chiefly made of *light, soft* flannel, must not be tight. *It is a great mistake to* bind the baby up tight with long bands, eople used to do. Needless to say, the body-linen t be frequently changed, but *it must not be washed soda, for that would irritate the tender skin.*

A healthy, happy baby wants plenty of amusement. is it when school is over, and big sister comes hat baby is always ready to spring out of mother's s to go to her? It is because the little thing

s a bit of fun with its lively young nurse. Girls be, and often are, very useful in taking care of , and amusing it at such times. But remember, the must be gentle, not rough and boisterous, for s *bones are only like gristle,* and rough play—even ess nursing—may cause them to bend, and so it a cripple for life, with perhaps a humpback, ed legs, or some other deformity.

For the same reason *baby must never be made to* *stand on its feet too soon*, for the soft gristly bones of the legs are not strong enough to support the weight of its body, and they will bend out of shape. The floor is the best playground for the little thing. If it is allowed to lie there and kick freely, it will get stronger and stronger every day, and by and by its own efforts to crawl about, and pull itself up by the furniture, will tell that it may be safely allowed to stand.

"Fresh air is very essential for the baby. During fine weather it should live as much as possible in the open air. Even in winter it should have its daily outing, except when the weather is wet or very cold. It should, of course, be snugly wrapped up to protect it from the cold in winter, but it is equally important to shield the eyes and head from the heat and glare of the sun in the summer.

"Wherever possible, baby should take its outing in a perambulator; it is far better than huddling the little thing in one's arms. But it is very thoughtless and careless for a girl to stand gazing in the shop-windows, or gossiping with a chance acquaintance (perhaps at the corner of a street), while baby is neglected and exposed, either to the danger of catching cold in winter, or to sunstroke in the summer. I once saw a perambulator knocked over by a big dog,

and the baby badly hurt, entirely through the thoughtlessness of the girl in charge, for she had actually left it standing at the side of the path, while she went across the road to speak to a friend.

"*Then, too, it* greatly pains and vexes me to see, as I often do, the little baby-head hanging uncomfortably over the side of the perambulator, and the nurse thoughtlessly gazing about her quite oblivious of the fact, and perhaps even at the same time carelessly jolting and jarring the wheels over the curb-stones. Such carelessness is very likely to do the little sleeper lasting harm, for the rough jolting is very liable to injure the delicate brain, or the spine, and so bring on fits.

"Whilst speaking of the thoughtlessness of some young nurses, I am led to say a few words about a common practice—a very wicked one I must call it. It is one which affects not so much very young babies as those that are older. I refer to the evil, thoughtless habit of frightening little children about big dogs, or ghosts, or the sweep, or the policeman.

"Let me implore you," she went on, and she spoke now most impressively, "let me beg of you never to be guilty of this cowardly practice. Children frightened in this way are haunted with terror in their sleep, the brain is irritated, and they wake up starting and screaming with fear. Nor is that all; the impression is more often than not a lasting one, and the child grows up (if it grows up at all) nervous and timid—afraid of its own shadow. Many and many a fine healthy child has been changed into a gaping idiot through the cruel, wicked act of some thoughtless nurse.

"Now, lastly, I have something to say about baby's sleep. In the ordinary way, if baby is properly fed and cared for, there will be no trouble about its sleep, and a young baby can scarcely sleep too much. But if from any cause the little thing is fractious and *fretful,* never resort to soothing syrups, laudanum, *poppies,* or any other sleeping-draughts to make it sleep. All drugs of this or any kind for inducing sleep are most injurious, and should never be used except under the express direction of the doctor.

"Indeed, all artificial plans for making baby sleep, such as rocking or jogging it, and walking about with it, are bad habits, which the little one soon becomes so accustomed to, that it will not go to sleep without them."

PART III.—COMMON AILMENTS AND THEIR REMEDIES

Lesson XXX

CATCHING COLD

"I am sorry to hear your mother cannot join us this evening," said the doctor, as he and Norah walked along together to the Institute a few days later.

"Mother thought it would be unwise for her to venture out, doctor," replied Norah. "She caught cold yesterday, and she is nursing herself up to-day to get rid of it. She knows just what to do, so she will soon be quite well again."

"Yes," said the doctor, "next to a thorough acquaintance with the Laws of Health themselves, stands the practical knowledge which tells one just what to do, when any of these common everyday ills come, as come they will; for, by treating these little ailments properly at first, we save ourselves much after-pain and suffering, and may oftentimes ward off *a serious illness.*

"Strange to say," he continued, "the next part of our course, which commences this evening, will deal with these '*Common Ailments and their Remedies*,' and I hope you will all carry away with you a rich store of useful knowledge."

By this time they had reached the Lecture Hall, and after a few words of introduction, the doctor at once entered upon his subject.

"Perhaps the commonest of all the common ailments which find their way into the home," he began, "is *a cold*—a very trifling ailment according to some people, for they frequently treat it with indifference, and neglect it because, as they say, '*It is only a cold*.'

"Yet it is an established fact, that more people die from the results of these neglected colds than from the worst of fevers. Let us confine our attention for the present to this particular ailment; the knowledge gained will well repay us for our trouble.

"We will first consider how the cold comes; then the nature of the ailment; next, the best means of preventing it; and lastly, how to get rid of it as quickly as possible whenever it does come.

"Now, to begin with, I need scarcely say that the cold is always the result of a chill. The chill itself, however, may be taken in a great variety of ways.

"People sometimes sit in a very warm room for a long time, and then go out into the cold air without taking the precaution to put on an extra garment. Of course they get a chill—indeed this is a more frequent cause of catching cold than any. Let me explain.

"The heated atmosphere of the room throws them *into a perspiration*, and their underclothing is probably *damp with* the moisture. What wonder is it then that, vhen they go out into the cold air without a good voollen coat or cloak to cover them up, the heat from heir body passes rapidly away, and the surrounding old penetrates through their damp clothes, and strikes vith a chill on the still perspiring skin?

"Another very common way of taking a chill is y sitting in a draught. The room itself is probably varm, and so is the person sitting in it, and under hese conditions a draught of cold air from an open vindow, or some such quarter, is almost certain to ause a chill.

"Sitting in wet clothes, or with wet feet, is another requent and very serious cause of catching a chill. he water from the clothes or boots evaporates as the erson sits, and it can only evaporate by robbing the ody of its heat—in other words, by chilling the body.

"Sleeping in a damp bed is, perhaps, the most errible of all the causes which lead to a cold, because he person falls to sleep unsuspectingly, and all the ime he lies in the bed his body is being robbed of s natural heat, to convert the moisture from the bed nd bedding into vapour. When he wakes up he eels chilled to the bone, and such a chill usually ends a most disastrous way. Damp, badly-aired body-nen will, of course, produce similar results.

"Let us next consider the nature of the ailment. he blood, as you are aware, is carried into all parts f the body by blood-vessels—*arteries, capillaries, nd veins.* You cannot prick the skin in any part f the body, even with the finest needle, without rawing blood, and this is sufficient to tell how closely he smallest of these blood-vessels are distributed just *nder the skin.*

"*Cold has the effect of contracting these blood-vessels.* When, therefore, the skin is chilled, all the vessels beneath and near it contract or close up, so that the blood cannot flow through them as it usually does. It must, of course, flow in some direction; consequently *it is driven inwards to the internal organs,* which thus become *overloaded,* or *congested* as we say, with blood, and some or other of the well-known symptoms of a cold begin to show themselves, such as sore throat, cough, sneezing, and running at the eyes and nose. The sufferer, too, feels shiveringly cold, although the skin all over the body is usually dry, parched, and feverish.

"Now, suppose we turn our attention to the best means of avoiding a chill. In the first place I would say, '*Always wear flannel underclothing.*' Flannel next to the skin is the best protection against catching cold, because, being a non-conductor, it prevents the body from getting a chill through parting with its heat.

"*Never go out from a warm room into the cold air without putting on an extra woollen garment of some sort.*

"*Never stand about in the cold air when you are tired or over-heated, but endeavour to keep up the warmth of the body by a brisk walk.*

"*Never sit down in wet clothes,* and *especially wet boots or stockings,* if you happen to have been caught in the rain; but *change the wet things at once for warm, dry ones,* and remain in a warm room. If you happen to have got very wet, bed will be the warmest place of all, and a hot drink of some sort before you lie down will soon bring back the natural warmth to the skin, and the cold will most likely be warded off.

"*Avoid, as far as you possibly can, getting wet feet at all.* Wet feet are a more certain source of danger than wet clothes. Thin shoes should always give place to stout, thick-soled boots and warm socks or stockings, as soon as the cold, wet weather sets in; and people who are exposed to the weather, or who have to stand about in the cold or wet, or on cold stone floors, should always be well protected in like manner about the feet.

"*Never sit in a draught if you know it.* It is a most insidious means of taking a chill. Much as I have taught you to love fresh air, you must get your fresh air in your rooms, and shops, and other places, without getting a draught at the same time, or you will be doing harm rather than good.

"Lastly,—and this I would say in all solemnity,—*Never be so cruel as to put any one into a damp, badly-aired bed.* Thousands have met with early death through careless housewifery in this respect. *Take every care that all body-linen and bed-linen is thoroughly aired,* before it is put out for use.

"Our last point to consider is, how to get rid of a cold as quickly as possible, when we get one. This should be a matter of serious consideration with everybody; for a bad cold, if neglected, may be, and often is, the beginning of a long illness, or it may so weaken the person as actually to lay the foundation of a fatal disease.

"As soon, therefore, as the first symptoms of a cold appear, remember that it is the result of a chill, caught in one way or another, and that nothing but warmth will remove it.

"*The most* effectual plan is to put the feet in hot mustard and water, and get into bed with an extra blanket or two in the way of covering, taking at the same time a hot drink of some sort, or some hot gruel. These things will encourage the flow of the perspiration, and so bring the skin and the blood-vessels beneath it back to their natural working order. Great care, however, must be taken the next day to avoid cold winds and draughts, for the pores of the skin have been opened during the night by perspiration, and the person is very liable to take another chill.

" A slight cold may often be warded off, if taken in time, by putting on some extra warm clothing, and taking from six to ten drops of spirits of camphor on a piece of loaf sugar every half hour.

"Just one word about the hot drinks. These should never be taken if the person is compelled to go out into the air. In such a case, the less drink of any sort that is taken the better, because, with the skin chilled, the perspiration is checked, and this means that the blood-vessels of the internal organs must become more and more congested, if much drink is taken."

Lesson XXXI

ONLY A COLD

"It is a curious fact," continued the doctor, "that two or three persons may be exposed to precisely the same source of chill, but the cold which results from *it will most* likely affect them in a variety of ways. *This requires* explanation, and the explanation is, that most of us have some spot weaker than the rest of the body. When, therefore, through the chilling of the surface, the blood is driven inwards, *the vessels of that weak part become distended and overstrained*, so that an inflammatory condition of the organ is set up, and this gives rise to irritation and pain.

"Hence it is that one person will suffer from a '*cold in the head*,' and another from a '*cold on the chest*'; while others may be seized with *neuralgia*, *rheumatism*, or *lumbago*, as the result of the chill. The commonest form of '*cold*' is that which attacks the respiratory organs; we will for the present confine ourselves to this.

"'*Cold in the head*' or '*Catarrh*,' as we medical men call it, almost always begins with a chilly, shivering sensation, although at the same time the skin itself feels burning hot, the lips and tongue are dry and parched, and the breath too is hot and feverish. There is usually an unnatural sense of thirst, and the body and limbs ache to such an extent that, the person often feels as if he had been beaten all over.

"All this is accompanied by violent sneezing, and such a feeling of stuffiness in the nose, that breathing through the nostrils becomes a matter of impossibility. Consequently the sense of smell (and with it the sense of taste) are temporarily lost. The nasal passages, indeed, are completely blocked up, for their delicate lining membrane becomes swollen and distended far beyond its natural size, because the vessels in it are unduly gorged with blood.

"In this state the membrane is so extremely irritable, that every breath of cold air *which enters the nostrils affects it*, and it is the irritation thus caused which gives rise to the uncontrollable fits of sneezing.

"To add to the discomfort, a thin, watery discharge from the nose and a similar running at the eyes set in, so that the pocket-handkerchief becomes a constant necessity. This watery fluid is poured out in a copious flow by the irritated membrane in consequence of the congestion, and the eyes are affected as well as the nose, because the lining membrane of the eye-lids is continuous with that of the nasal passages, and is therefore congested in like manner.

"The discharge from both eyes and nose is of a scalding, irritating nature, and it blisters the nostrils, lips, and other parts as it flows, making them red and sore.

"Although the symptoms first show themselves in this way, the disturbance rapidly extends downwards into the throat, because there too the lining membrane is simply a continuation of that in the nasal passages. This membrane soon becomes congested, swollen and irritable like the rest, especially in the neighbourhood of the tonsils. It is intensely red, owing to the gorged state of the vessels in it, and the irritation gives rise to a painful pricking sensation, while the throat itself becomes so sore that swallowing is a matter of more and more difficulty.

"At this stage, too, it is a common thing for the sufferer to become quite deaf for the time—not that the '*cold*' has directly affected the ear itself, but because the Eustachian tube, the passage leading downwards from the ear into the pharynx, has *become* congested, swollen and closed up like the parts *near it.*

"If left unchecked, the disorder will soon pass ownwards into the wind-pipe, and that peculiar, ritating tickling will begin, which results in a dry, arsh cough.

"When the '*cold*' has spread so far, the walls of ll these air-channels—throat, wind-pipe, and nasal assages alike—are swollen up to an unnatural extent, nd present (if you could see them) the same intensely ed appearance, because the vessels in them are all orged and distended with blood; and I want you to emember that this is always the condition, when any rgan is congested or inflamed.

"Although, as a rule, colds commence in the form f nasal catarrh, and gradually spread downwards in he way I have described, it is no uncommon thing ith some people for the attack to fall at once upon he lungs, and the air-passages leading from them. he lungs in fact are the weak spot in such cases; ence they are first attacked, and we say the sufferer as a '*cold on the chest.*'

"When this is the case, the delicate membrane which ines these air-passages becomes inflamed and irritated, nd, like the other membranes under similar conditions, egins to pour out the same watery fluid or mucus. his fluid, because it cannot flow away, accumulates the air-passages, and chokes them up, so that reathing becomes more and more difficult; and the ritation caused by it there gives rise to a distressing ugh in the effort to remove it.

"Sore-throat, hoarseness and a highly feverish ndition of body are the usual accompaniments of e disorder, which demands immediate and careful eatment, if more serious diseases are to be warded off.

"Simple nursing in a warm room, and on the lines I have already laid down, will often do all that is necessary in the case of adults; but where children are concerned it is different, because a child has not the same power of resisting an attack of this kind that a grown-up person has. The doctor should be called in the moment the child shows a difficulty in breathing, for delay or neglect then will quickly lead up to bronchitis or inflammation of the lungs.

"Large, warm poultices of linseed meal, with or without mustard, according to the severity of the attack, may be safely applied to the chest and back, whether the sufferer be an infant or grown up. This will help to loosen and disperse the mucus, which is clogging the chest; but it is a great mistake to give the patient cough mixtures containing laudanum or chlorodyne to relieve the cough. These things certainly will stop the cough, but, if they do, the mucus will be left to accumulate in the air-passages, and so clog up the lungs still further. No cough mixture should ever be used in such cases, but what the doctor himself prescribes.

"Much may be done to avoid these respiratory attacks by keeping the body well covered with warm clothing, and the feet warm and dry. Mothers can scarcely expect to keep their children free from colds, if they allow them to go with bare arms and legs, with their chests and throats exposed, and their feet ill-protected with thin shoes.

"Children should, as early as possible, be taught to breathe through the nostrils and not through the open mouth, for this in itself is a good safe-guard against *catching cold.* The cold air, instead of passing direct into the lungs, becomes warmed as it flows through the nasal passages, if people will only accustom themselves to breathe in the right way.

"The more weakly and delicate people are, too, the more liable they are to catch cold. Hence everything that tends to brace up the system, and make it more robust, will add to the power of resisting a chill. Simple, wholesome food, plenty of exercise in the open air, a regular habit of the bowels, and a clean skin will do much in this direction.

"A regular morning bath of cold water is one of the surest preventions against chill, but unfortunately every constitution does not take kindly to this, and it would be altogether a mistake to force it upon all alike. Whether it be warm or cold, however, the bath is absolutely necessary to keep the skin healthy and vigorous enough to resist a chill."

Lesson XXXII

NEGLECTED COLDS

The doctor was so well satisfied with the impression, which his sound practical advice had evidently made upon his hearers, that he determined to devote another evening to this all-important subject of *catching cold*, and its possible consequences.

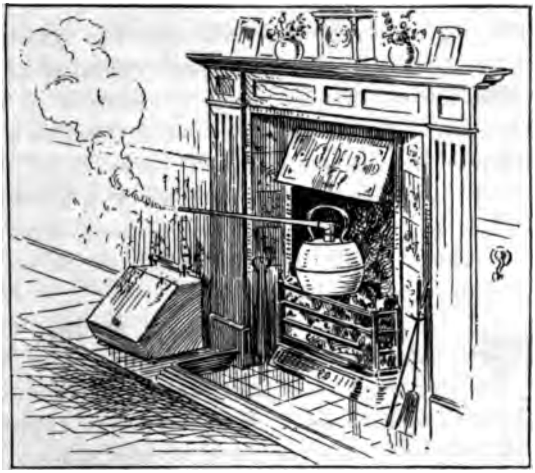
"I have said enough already," he began, "to show you the dangerous nature of even a '*common cold*'; but I myself have such a wholesome dread of this ailment, and its power for evil, if it is not checked in time, *that before I leave* the subject, I must say a few words about some of the very serious diseases, whic result from neglected colds—such as bronchitis, ir flammation of the lungs or pneumonia, pleurisy, an consumption.

"The purpose of my remarks will not be to teac you the treatment required in each case, for, of cours when matters have reached this stage, skilled medic aid is absolutely essential. I simply want you t understand the nature of the disease, in order th you may be prepared, in the capacity of sick nurse, t take your share of the work should occasion requir and act intelligently under the doctor's orders.

"Bronchitis is nothing more nor less than tl spreading of the catarrh downwards into the bronchi tubes of the lungs. The lining membrane of the tubes becomes inflamed and irritated, as in ordina catarrh, because the vessels in it are gorged wi blood, and in this state there is a constant flow mucus from them, which fills the air-passages ther selves. This creates a painful sense of tightness the chest, and the breathing becomes laboured; whi the air itself passing over the inflamed surface of tl tubes gives rise to a dry, irritable cough.

"Children, and especially infants during the teet ing period, are very liable to develop bronchitis. may be readily detected by applying the ear to tl child's chest, or preferably to the shoulder blades. bronchitis has set in, there will be a sort of bubbli sound, which is caused by the air forcing its wa through the fluid in the tubes as the child breathe and the nature of the bubbling will quickly tell th listener whether the larger or the smaller tubes ar affected.

"Of course the one thing necessary for recovery is the effectual clearing of these breathing tubes. The patient should be kept in one room, and at a regular temperature ranging from 60° to 65° Fahrenheit; and a bronchitis kettle should be kept boiling on the hob, in order that the constant flow of steam from it may keep the air of the room moist as well as warm.

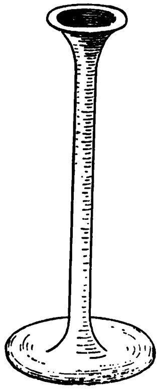


"This warm, moist air softens the dry, swollen membranes of the tubes themselves, and at the same time helps to break up the discharge in them, which otherwise has a tendency to become a thick yellow mass.

"Hot poultices to the chest and back will do much in the same direction, and frequent doses of ipecacuanha will enable the sufferer to spit up the phlegm as it *becomes loosened*; but I have already warned you to have nothing to do with opium or any other drugs to allay the cough, except under the doctor's orders.

"In pneumonia, or inflammation of the lungs as it is commonly called, the trouble is more deep-seated still, for in this case the congestion spreads into the air-cells at the very extremity of the finest tubes. That is to say it is the substance of the lung itself which is attacked, for, as you know, the lung is simply a mass of these air-cells.

"The walls of the air-cells and the fine tubes leading to them become swollen and congested to such an extent, owing to the gorged condition of their blood-vessels, that the passages close up; while at the same time the discharge which oozes from them, instead of being a watery fluid, is of a gelatinous nature, and at once begins to form a thick, solid clot, which completely fills both air-cells and tubes, and thus excludes the air altogether.



"Indeed, the part of the lung which is affected becomes for the time being a solid mass, for the air-cells are entirely obliterated. If the ear were applied to the chest or back of the sufferer, the soft, rustling sound, which is always caused by the air entering and leaving the air-cells, when the lungs are in a healthy state, would no longer be heard.

"The practised ear of the doctor, even with the help of his stethoscope, would fail to detect the least rustle, and if he tapped the affected part with his fingers, it would give out a dull, solid sound, instead of the usual hollow one.

"Of course, the sufferer is in a high state of fever all the time—the temperature usually rising to 104° and even to 106°. The skin is hot and dry, the tongue parched and furred, and the breathing painfully rapid. There is also a short, troublesome cough, and more or less frequent periods of delirium.

"The doctor is badly wanted now. All that the nurse can do is to rigidly follow out his instructions as to temperature, diet, poulticing and such things; and if the patient recover, great care must be taken for a long time, as such an attack always leaves the lungs extremely weak, and susceptible to another chill.

"Some cases of chill affect not the lung itself, but the membrane which encloses it. This membrane is called the Pleura, and thus the disease gets the name of pleurisy. The pleura is a sort of double bag; the outer one is attached to the walls of the chest, the inner one is folded closely over the lung itself. It is known as a serous membrane, because in the healthy state a thin watery fluid—serum—oozes out between the two folds, and keeps them moist and smooth, so that the lungs are able to work without friction.

"Try to picture to yourselves this membrane congested and inflamed in consequence of a chill. In that irritable state it pours out, not the usual small quantity of fluid required to moisten the working surfaces, but such a copious flow that the two folds are forced asunder by it.

"The ribs are rigid and will not yield to the pressure, and in consequence the lungs themselves, and with them often the heart as well, are forced out of their place. Every breath that is drawn causes a *sharp stabbing* or tearing pain in the neighbourhood of the affected part; indeed it becomes impossible to draw a deep breath, and the pain increases in intensity with coughing or sneezing, till it is almost unbearable.

"In this case the nurse can do almost as much as the doctor, for the one thing needed is a constant succession of large, hot linseed-meal poultices, with mustard added occasionally. Of course the patient must be kept in bed, and at one regular temperature—not too warm. But as a rule it takes a long time—sometimes weeks—before the fluid is absorbed, so that breathing can go on without pain, and even afte recovery great care will be required to prevent a repetition of the trouble.

Lesson XXXIII

CONSUMPTION

"A common cold you see," resumed the doctor after a short pause, "is a much more serious matter than some people seem to think, because of the danger that lurks behind it, if it is once allowed to get the mastery. I cannot leave this all-important subject without saying a few words about that terrible enemy of the human race, which year after year claims its victims in such numbers, that there are few families which have not suffered from its ravages. The enemy to which I refer is consumption, and the reason why I refer to it here is that in a vast number of cases the disease may be traced back to 'colds,' *which have* been neglected and left to take their *chance.*

" The disease is very appropriately named consumption, for one of its chief characteristics is a gradual wasting away. This wasting process begins in the ungs, but rapidly spreads through the whole substance f the body, till in the end the sufferer is little more han skin and bone.

" Neglected catarrh, which is allowed to spread lownwards into the lungs, and there develop into a evere '*cold on the chest,*' or perhaps into *pneumonia*, s a very frequent cause of this fatal disease. Careless eople will often get cold upon cold, and neglect them ll, till it is too late.

" The gelatinous matter, which always oozes through nto the air-cells when the lungs are congested and nflamed, may be made to disperse with proper treatnent at the time, and the air-passages will be once nore free. If the cold, however, is neglected at this tage, or if the person ventures out too soon, it will ccumulate where it is, instead of dispersing, and so lock up the passages with a thick clotted mass, which radually assumes a cheesy appearance.

" The part of the lung so affected loses its spongy aracter altogether, and in course of time the thin licate walls of the cells themselves become so closely herent to the cheesy mass on either side, as to come, like it, dead matter.

" Presently this cheesy mass begins to break up d become liquid, the irritation caused by it gives se to a cough, and in this way the foreign matter is at up. If this were all, perhaps no great harm ould be done; but the truth is that the cheesy aterial, in breaking up, tears away the delicate cell-*alls of the lung* which adhere to it, and so the coughing brings up each time the actual substance of the lung itself, thereby leaving a hollow cavity.

"This is probably going on in different parts of the lung at the same time, and so a number of cavities are formed, which at last break one into another till the whole of the organ is wasted away.

"I need scarcely remind you that the lungs in such a state of disease are quite unable to do their proper work of purifying the blood. Consequently, the blood which circulates through the system is an unwholesome stream, altogether incapable of repairing the daily loss of tissue, and this accounts for the gradual wasting away in all parts of the body.

"This fell disease has many phases, but I cannot do more than give you a general idea of its nature and progress. On the principle, however, that *forewarned is forearmed* and that *prevention is better than cure,* I shall now proceed to give you a few valuable hints for your own future guidance.

"First and foremost let me say that consumption is universally looked upon as an hereditary disease. Now this does not mean to say that consumptive parents always transmit the actual disease itself to their children, but that children may inherit from their parents a weak, delicate constitution, which will leave them an easy prey to consumption, unless they exercise every care.

"This is a fact which should never be lost sight o especially by those whose near relatives have fallen victims to the disease, for even the inherited tendency to consumption may be counteracted by careful living

"*Persons* with such a tendency should do every*thing in their* power to maintain the general heal of the body. The food should be simple, nourishing and easily digested, the daily meals should be regular, and the bowels should never be allowed to get disordered.

"The body should be sponged daily with tepid water, and briskly rubbed afterwards, in order that the skin may properly perform its functions, and the underclothing should always be made of some woollen material.

"Mothers should see that their children have plenty of good exercise in the open air, and especially such exercise as will strengthen the muscles of the chest. Indeed a child with consumptive tendencies cannot have too much fresh air, always provided of course that the fresh air does not bring draughts and chill.

"By plenty of exercise I do not mean prolonged or excessive exertion, for that has an exhausting tendency, and is at the same time likely to throw the child into a perspiration, which will be a sure forerunner of chill, f it sits about afterwards to get cool, as it probably will.

"I would specially guard you against two very requent mistakes. Some mothers, in their anxiety or their delicate children, think to do them good and keep them from danger by coddling them up. They keep them shut up in the house for fear the wind should blow upon them, when they would be much better off in the fresh air outside; and when they do allow them to go out, they smother them up with so much clothing that they not only do away with all free and healthy movement, but they make even the simple work of walking such a toil, that the body quickly becomes hot and damp with perspiration, and then a chill is very easily taken.

"In this way they actually court the very dangers they are anxious to avoid. The child, in fact, from its close confinement to the house, becomes a sort of hot-house plant, and is unable to resist the least breath of cold, chilly air outside.

"Some mothers, on the other hand, foolishly think to ward off the trouble by *bringing the children up hardy*, as they call it. They leave the chest, arms and legs unprotected, and expose the children to every kind of weather, in the hope that this exposure will harden them to such an extent, that cold and chill will have no effect upon them. This, of course, is absurd in the extreme. The child should at all times be so clothed as to maintain the natural warmth of the body, without causing any restriction to its healthy movements.

"Lastly, for the sake of those who are now strong and healthy, as well as for those who are weak and delicate, I will repeat the warning I have already given you. *Avoid, as far as you are able, all chance of taking a chill; but should you catch cold do all you can to get rid of it quickly, and never leave it to take its chance, for we cannot tell how a common cold may end.*"

Lesson XXXIV

COUGHS

"*All* these affections of the respiratory organs are *ompanied* by a more or less troublesome cough."

tinued the doctor; "and so very few people seem understand how to treat a cough properly, that I nd to close the subject with some remarks on this ressing malady.

"Coughs arise from a variety of causes, and present orresponding variety of symptoms. It should not, efore, be a matter of surprise that they require a ety of treatment. Indeed the treatment of each ends entirely on its cause; what would be bene- l in one case would be hurtful in another.

"The cough is always the result of irritation of the ves, which are spread over the lining membrane of upper part of the throat; but the cause of the ation is not always the same.

"It may be that the lining membrane of the nx, or upper part of the windpipe, is inflamed and able as a result of the chill; and in such a case y breath of cold air which is drawn in acts upon and the cough follows as a spasmodic effort to ove the irritation.

"It very frequently happens too that the throat the parts near it become relaxed and swollen, and n this is the case, the uvula—that little tongue of h which hangs down at the back of the mouth— omes elongated to such an extent that it touches root of the tongue, and causes a tickling sensation e. This gives rise to a constant, hacking cough.

"Then again the irritation may arise from the ling of the phlegm or mucus, which is poured out the disordered membrane of the air-passages of the gs, and this is the universal cause of the cough in chest diseases. Thus we have two distinct kinds ough—*throat cough and chest* cough.

"A throat cough is either short, rough, and rasping, or else it resembles a loud, hoarse bark, but in either case there is no desire to spit, for the simple reason that there is nothing to spit up. This is why it is usually called a *dry cough.* It is a sort of uncontrollable spasm to relieve the irritation in the throat.

"The chest cough, on the contrary, is caused by the irritating influence of phlegm and other matter which is swept up from the lungs, and each act of coughing is an effort to clear away some of this clogging, foreign matter, which the sufferer spits out.

"So much then for the causes and nature of these different kinds of cough. Now let us glance at the treatment which each requires; and I want you to pay particular attention to this, and you will then understand how absurd it is for people to fly to the usual cough-mixture for every cough, without giving a thought to the nature of the cough itself.

"The cough, which usually attends a slight cold, is a throat affection, and arises from the swollen and irritable condition of the larynx and the parts near it. This may be relieved by warm linseed-meal and mustard poultices applied to the throat, or in more severe attacks by wrapping the throat with a piece of flannel sprinkled with turpentine. The warm application cures the cough by first curing the *sore throat,* the cause of the cough.

"In such a case small doses of cough-mixture, containing opium, laudanum, or other similar drugs, will help to relieve the cough without causing any bad effects, but, of course, such things should never be given to very young children.

"In attacks of bronchitis, inflammation of the
ngs, or even a cold on the chest, none of these
othing drugs should be used to allay the cough. In
l these disorders the main object is to get rid of the
reign matter, which is clogging up the air-passages.
ese soothing drugs would probably stop the violence
the cough for a time, but only by stupefying the
rves of the lungs, which would thus be rendered
werless to expel the hurtful matter—the original
use of all the trouble. Every dose would therefore
an a further accumulation in the air-passages, and
aggravation of the disease.

"Poultices, and other warm applications to the
est and back, will afford the greatest relief in such
ses, for they will loosen the phlegm, and a mixture
ipecacuanha and syrup of squills will afford a
rmless and valuable aid in expelling it without too
uch strain in coughing.

"In the case of a cough arising from elongated
ula, there is only one effective remedy, and that is
have the lower end of the uvula itself cut off.
is, of course, is the doctor's work, but it is not nearly
ch a serious operation as one might suppose, and
en it is done the cough usually ceases as if by
gic, for the uvula is not long enough then to
oduce the tickling irritation.

"I cannot leave this subject without giving you a
tle advice about one of the most terrible scourges to
ich young children are liable. I mean *whooping-*
ugh. This distressing malady is especially a children's
sease, and it is almost as fatal in its effects as the
ost virulent of fevers. The younger the child too,
e *greater the* danger seems to be, for quite three-

fourths of all the fatal cases every year are those of infants less than two years old.

"True as all this is, however, I am bound to say, and I say it very sorrowfully, that neglect, ignorance, and foolish exploded traditions are responsible for the vast majority of these infantile deaths.

"Whooping-cough does not come, like other coughs, as the result of cold; one child catches it from another by taking its breath. In other words, we say it is an *infectious disease,* but of this I shall have more to say later on.

"In its early stages its symptoms resemble those of a common cold, but the cough rapidly becomes more and more troublesome, and in a few days the unmistakable whoop is heard. The strain of a fit of coughing is such a terrible tax upon the child's strength, that the face becomes swollen and purple, the veins stand out as if ready to burst, and the eyes seem to start from the sockets. Very frequently too all this is accompanied by bleeding from the nose, and even from the throat. When the fit is over the child lies back exhausted, its skin reeking with sweat.

"These are the symptoms which all may see for themselves by watching the little sufferer. Now let me explain something which you cannot see, for in this lies the whole danger of the disease.

"When the violent and convulsive fit of coughing comes on, the air in the lungs is suddenly forced back upon the walls of the air-cells, just as we might force air into an india-rubber air-ball with a pair of bellows. The walls of the air-ball are elastic enough to resist a certain amount of pressure, but if we forced too much air into it, of course the ball itself would burst.

"Apply this to the delicate air-cells of the lungs, .d you will be in a position to understand the danger tending these violent attacks of coughing, especially the case of very young children. Even if immediate ischief is not set up by the actual bursting of the r-cells, the cell-walls become so over-strained that ey lose their elasticity and their power to contract ain, and this constitutes the first step towards certain ng disease in the future.

"All this goes to prove that everything that can ssibly be done to lessen the violence of the coughing s should be done, if the child is to finally recover m the attack without any ill effects in after life. arm flannel clothing, and careful protection from aughts, and damp, cold winds are the very first sentials; all the doctor's medicines and embrocations ll be of little avail if the mother neglects this vice.

"There is an old tradition among senseless, ignorant ople, that the best way to get rid of whooping-cough to take the suffering little child to the bleakest and ndiest place to be found, and let the wind blow on it. The wind, say they, will blow the whooping-ugh away. So it will, but only by blowing the tle life itself away. Never pay heed to any such olish rubbish.

"Would those same people think of taking a child t with bronchitis, inflammation of the lungs, a sore roat, or even with an ordinary cold? Certainly not; ey would at once recognise the necessity of warmth r fighting the disease. What folly, what madness it ust be then for them to set common sense at defiance *the case of* whooping-cough, where the only hope is in reducing the violence and the number of the attacks. Remember that warmth and a carefully regulated temperature are the only means of doing this; and then you will learn to pity those little sufferers who are ignorantly exposed by their mothers to the bleak winds of an open common, in the vain, foolish hope of conquering the disease.

"There is, I may say in conclusion, a sort of popular belief that, whenever whooping-cough comes, it will not leave the patient till May. But why in May? I will tell you; it is because then the cold weather is all over, and the genial warmth of summer is at hand. The warm, sunny days do more to cure the cough than anything else; although I may add for your benefit that an attack of whooping-cough, whenever it comes, should not last longer than six weeks if it is treated on common-sense lines such as I lay down."

Lesson XXXV

INDIGESTION—THE MILL

While he was looking over his books, and trying to fix upon the most appropriate subject for the next lecture, even the doctor himself was surprised to find that he had so many patients suffering from disorders, which could be distinctly traced in one way or another to injudicious feeding. Cases of this kind in fact outnumbered those arising from any other common ailments—colds and their attendant evils perhaps excepted. "Yes," he said to himself, "*indigestion* or (as we doctors call it) *dyspepsia* shall be the next subject to claim our attention."

Accordingly when he next met his friends at the nstitute, he began by saying that, just as carelessness n taking a chill may bring about a multitude of evils f one kind, so carelessness even in our daily meals is ften the fore-runner of long continued suffering of nother kind.

"What a pity it is," he added, "to find, as we so ften do, that eating and drinking, which ought to be eckoned amongst the pleasures of life, become through ur own indiscretion and over-indulgence the means of roviding a scourge, to torment us with untold ailents, which can easily render our daily existence iserable.

"The sole aim and end of all feeding is to make lood to nourish the body. Whenever, from any ause, the proper conversion of the food into blood does ot take place, it is due to defective or bad digestion.

"This bad digestion, which we speak of indiscrimiately as dyspepsia or indigestion (for both terms mean recisely the same thing) is brought about by a multide of different causes, and leads up to as many isorders and diseases. The food in fact passes into e stomach and bowels, only to give rise to feelings discomfort and pain as long as it remains there; d it does no good whatever, because it is not digested d made into blood. It practically leaves the body it entered it.

"To understand the subject properly we must member that, in the work of digestion, a certain part the process is performed in the mouth, another part the stomach, and another in the bowels, and that the ecial work of *any one* of these organs *cannot be per-med by the others*. If therefore, from any cause whatever, either of these processes is imprope performed, it cannot but interfere with the whole the work, and when this is the case, bad digesti that is indigestion, or dyspepsia is the result. body in this respect resembles some elaborate piece machinery, in which the loss of a single cog fro wheel interferes with the whole of the working.

“ One of the commonest causes of indigestion is habit of eating too hastily. When the meal is hurr through, the food, instead of being properly chewed, a well soaked with saliva, is bolted, and passed down lumps into the stomach. Thus the first part of process, which ought to send the food down in finely-divided state, is not properly performed, a the result is that the beneficial aid of the saliva is l altogether. But this is not all; for the gastric ju in the stomach itself, instead of meeting with a we ground-up mass of food, with which it can read mix, finds only these hard lumps, and it can do lit more than act slowly upon the outside of them. T means to say that its work of breaking down a dissolving the food is greatly impeded, unnecess labour is thrown upon the stomach, and, in spite this, much of the food is cast out in an undigest state after all.

“ The inevitable result is that the poor over-work stomach breaks down altogether at last in its impossi attempt to do, in addition to its own proper work, t which ought to have been done by the mill specia provided for the purpose. When this is the case, pleasure and enjoyment in eating are gone—indeed t sufferer dreads to eat at all, because of the discomf and pain which follow every meal. Such persons dyspeptics, and know it, but the blame lies at their own door.

"The usual symptoms of such a condition are an uncomfortable sense of oppression and fulness after meals; pains between the shoulders, and at the pit of the stomach; flatulence, and a more or less constant belching-up of wind from the mouth; and a constipated habit of bowels. This last is the further cause of mental depression, headache, and a general disinclination for exertion of any kind.

"Unfortunately, these evils are not confined to lazy individuals, who lie in bed too late in the morning and thus get into the habit of 'bolting' their breakfast in a few minutes; nor to those who are so busy during the day that they grudge to allow proper time for their meals.

"To such as these I have only one piece of advice, and that is that they use the mill which nature has given them; otherwise their folly will sooner or later find them out.

"Some people, however, and especially those who are getting into years, suffer much from this form of dyspepsia, not from any acquired habit of eating too rapidly, but because they are unable to properly masticate their food, owing either to bad teeth or to the actual want of teeth.

"The dentist is the best doctor for them. A set of false teeth will do them more good than all the medicine in the world, for what they want is a new mill.

"And now, before I leave this part of our subject, let me say a word or two to the young people. You *have good sound teeth*; but do you value them at their true worth? I am afraid, with many of you at least, it is the old, old story; for it is our common failing that we rarely appreciate even our greatest blessings till we have lost them for ever. I have shown you that the general health depends very largely upon the teeth, because of the important part they take in the work of digestion. Therefore do all in your power to keep in good working order the mill which nature has given you."

Lesson XXXVI

INDIGESTION—THE STOMACH

"Defects in the mill and its working, however, are not the only cause of indigestion," pursued the doctor; "for it sometimes happens that the stomach itself refuses to do its share of the work, even though the food is sent down to it from the mill in a properly prepared state.

"The healthy stomach, of course, never acts in this way, but when once the organ gets deranged, it seems to lose all its tone and vigour, and to have no energy for its proper work. Now what is its proper work?

"If you think for a moment, you will remember that, just as the mill and the saliva of the mouth are responsible for the digestion of the starch foods, so the stomach and the gastric juice which it pours out are responsible for the digestion of the nitrogenous foods. Without an adequate supply of gastric juice, indeed, there can be no digestion in the stomach.

"*The first and most important work of the stomach, therefore,* is to provide the gastric juice itself, and when the organ is in a healthy state, that fluid oozes out from the sides of the great bag, in very much the same way as we see the perspiration ooze out on the surface of the skin.

"Now when the stomach, from any cause, becomes sluggish and out of tone, the very first result of the derangement shows itself in some obstruction in the flow of the gastric juice. In one case it may be that the quantity of the fluid supplied is altogether insufficient; in another the fluid itself, although perhaps sufficient in quantity, may be quite unfit for the work it has to do.

"The gastric juice, of course, like all the other juices of the body, is drawn from the blood. If, therefore, the blood itself is poor and thin, it cannot afford to part with the material required to provide the stomach with gastric juice, of suitable quality, and in sufficient quantity, for the proper digestion of the food.

"In such a case the two diseases act and re-act upon each other as cause and effect. This explains why anæmia (bloodlessness), a very common disease among girls and young women, is always accompanied by dyspepsia.

"In some cases of dyspepsia the gastric juice contains so little of its natural acid properties, that it is unable to act upon the food properly; in others there is an excess of acid, and the acidity in the stomach gives rise to heartburn, flatulence, and a painful sense of fulness. While this lasts small quantities of the acid fluid belch upwards into the mouth every now and then, causing a disagreeable burning sensation all the way up the gullet, and seeming to leave it quite raw and sore.

"These, and other dyspeptic conditions of the stomach, are brought about by a variety of causes, but over-eating is a more prolific cause of them than anything else. People who eat for eating sake, force more work upon the stomach than it can do. It struggles hard to do the work for a time, but at last it becomes weakened, and breaks down altogether.

"Remember what I once said about temperance in eating. Enough is not as good as a feast. Enough is better than the best feast in the world, if by a feast we mean eating too much. Do not over-tax your stomach, and you need have little fear of dyspepsia.

"Those who indulge in heavy suppers late at night throw a great strain upon the stomach at the very worst part of the day—at a time when the whole of the bodily faculties are more or less jaded and worn. Such people are undoubtedly laying the foundation for future dyspepsia. So too are those who habitually eat between meals, at all hours of the day; for they keep the stomach constantly on the strain, instead of giving it its regular periods of rest, which it requires as much as any other part of the body.

"Regular meals at intervals of five hours are thus found to be best for adults, because this arrangement allows four hours for the work of digestion, and an hour for the stomach to rest after its labours. For growing children the interval should not be so long.

"It is important to remember, that too long an interval between one meal and the next is hurtful, for we then sit down to the table very hungry, and are likely to overload the stomach with an unusually *heavy meal.* Those whose business takes them away *from home* during the day are generally great offenders in this direction. Instead of practically fasting from breakfast time till their return home, as many do, they would act much more wisely by taking a light meal of some sort in the middle of the day.

"But the quality of the food is often as much to blame as the quantity, and, strange to say, unsuitable food is to be found on the tables of rich and poor alike. In one case the table is frequently loaded with rich foods, which are most difficult to digest; in the other coarse, inferior food and bad cooking are equally injurious. Remember, plain, simple, well-cooked food is best for everybody, because it throws least labour on the stomach to digest it.

"Too much liquid of any kind with the meals, whether it be tea, coffee, alcohol, or even water, is also very hurtful, because it so dilutes the gastric juice as to render it unfit for its proper work. Above all, the constant use of tea at all meals cannot be too strongly condemned, for the active principle of tea tends to delay the digestion of the food with which it is taken. This is the case even when the tea is freshly prepared; but it is doubly injurious when it is allowed to stand, or if it is made strong, for then the tannin in the leaf acts as an astringent upon the little glands in the walls of the stomach, closing them up, and so preventing them from pouring out the necessary supply of gastric juice.

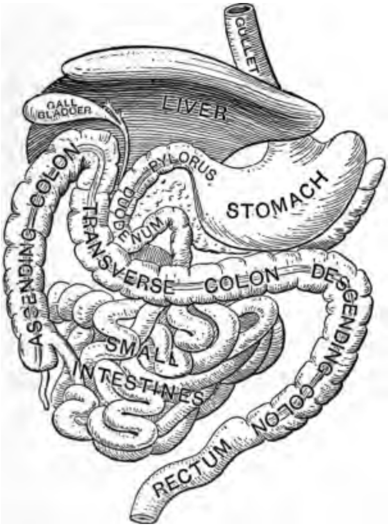
"I need scarcely say that alcohol in any form, and in any quantity, is best avoided altogether, even with the daily meals, and this piece of advice I mean, of course, for grown-up people, as no one expects children to take it.

"*You notice,* as before, that I am still acting on the principle that '*prevention is better than cure.*' would much rather teach you how to avoid these evils, than how to deal with them after, through your own carelessness, you have contracted them."

Lesson XXXVII

INDIGESTION—THE LIVER

"Look at this drawing; it will show you what you are like inside," the doctor went on. "This, you see, is the stomach—the great bag in which the food is digested. Here, at the smaller end of the bag, there is an outlet, and from it a long narrow tube—the commencement of the bowels—leads downward. If this tube were stretched out to its full length, it would measure about five times the entire length of the body, and yet it is all snugly packed away in the small space provided for it in the abdomen. *This explains* why it winds about in all these folds or *convolutions.*



"Now, I need scarcely say that a long, winding tube of this description would never have been provided, unless there were important duties for it to fulfil. The fact is, the last, but certainly not the least, essential part of the work of digestion is carried on in the convolutions of this long tube.

"Even when the mouth and stomach have faithfully and properly performed their duties, the starchy and nitrogenous matters are still the only parts of the food that are digested and fit to pass into the blood. The stream, which flows out from the stomach into the bowels, contains the whole of the fat in its original undigested state.

"It is the special office of the bowels to digest this fatty portion of the food, and they are assisted in the work by that great organ, the liver, which is situated on the right of the stomach. Indeed, the bowels do the work, but the liver manufactures and supplies the special material required for dissolving the fat.

"This material is the greenish-yellow, slimy-looking, bitter, alkaline fluid, called bile. Its importance in the work of digestion is seen from the fact that the one duty of this large organ, the liver, is to prepare it, and pour it into the intestine, to meet the partly digested food as it leaves the stomach. That which is not required for present use is stored up in a little bag in the liver, called the gall-bladder.

"But although it has no other duty besides this, the liver in a healthy man or woman is one of the most hard-worked of all the organs; and it requires a considerable amount of tact and common-sense management to keep it in proper working order—to prevent *it from getting* sluggish and lazy; and, I may add, a sluggish liver is a certain cause of dyspepsia in some form.

"Most dyspeptic sufferers are ready enough to blame their livers for all their woes, but the fault lies at their own door. They will tell you that they suffer from a bad liver, but in reality it is the poor liver itself which suffers from their own bad treatment.

"There are four things which tend, more than anything else, to change a good liver into a bad one, and they are gluttony, want of proper regulation of the times of eating, want of exercise, and alcoholic drinking.

"Now as regards the first of these, I may say that, although I called the liver a hard-working organ, we must remember that, like everything else, it has its limit of endurance. People who go on eating for eating sake, trying to tempt and stimulate their palate with a variety of rich dishes and appetising sauces, long after the natural appetite has been satisfied, are laying too heavy a burden on even such a willing, hard-working servant as their liver.

"It will, of course, attack the task which it is set to perform, and bravely struggle on for a time, but before long there will be a break-down, and it will become torpid, sluggish, and utterly unfit for its duties. Then the heavy feeder suffers from his liver, and nothing but a long course of medicine and abstemious living will bring the organ back into a healthy state.

"Eating between meals, and at all hours of the day, is as hurtful to the liver as it is to the stomach, because the liver, like the stomach, demands and will have its period of rest after work. It cannot be kept *incessantly on* the strain (as it is with people who are *always eating*) without the most serious consequences.

"Perhaps, after all, the commonest enemy to the er is want of proper exercise. The liver depends on the blood, which courses through it, for the terials for the manufacture of its bile—the greater flow of blood, the better it is for the work to be ne. Exercise, as you know, stimulates and promotes circulation. People who live and work in the en air, and even those engaged in sedentary occutions, provided they take plenty of healthful exercise the leisure time, need not fear the tortures of a ggish liver.

"With regard to the last enemy, alcoholic drinking, thing need be said. It is as hurtful to the liver as is to the other organs of the body. Therefore shun One form of disease which results from spirit inking is known as drunkard's liver. It is a terrible ease, and usually tortures the sufferer for years fore it cuts him off.

"In connection with this subject let me now say a w words about a very common ailment, generally own as a '*bilious attack*,' for this is another result a dyspeptic condition of the stomach and bowels.

"Its well-known symptoms are a severe headache d mental depression, a sense of repulsion against all d, a white, thickly-furred tongue, and a nauseous, ter taste in the mouth. All this is accompanied by kness and vomiting, and the vomit, from being ged with bile, gives the disorder its familiar name, *bilious attack.*'

"It results either from too rich living, or from ne irritation of the stomach and bowels. In the e case the rich fatty food makes such extraordinary nands upon the liver for the supply of the necessary bile to digest it, that the organ is unable to keep pace with it, and it is the mass of undigested fatty matter in the bowels which sets up an irritation there, and causes the sickness and vomiting. The strain of the retching draws some of the bile upward into the stomach, and it is discharged from the mouth with the vomit. But it is the retching that causes the bile to overflow into the stomach, and not the bile that gives rise to the retching.

"Almost identical symptoms of indigestion may be set up by an irritation of the inner lining of the stomach; sometimes as a result of cold, or of alcoholic drinking. This is known as gastric catarrh, or catarrh of the stomach, because the lining membrane is affected in precisely the same way as the membranes of the respiratory organs in common catarrh.

"The only treatment for these attacks is, first of all, to relieve the bowels of the irritating cause of the disturbance with a dose of some saline medicine, such as Eno's Fruit Salt, or a Seidlitz powder, and then to carefully abstain from all rich fatty foods and pastry, and above all from alcoholic drinks. Plain, simple food and plenty of exercise, with an occasional purgative in the morning for a time, will quickly restore the disordered functions."

Lesson XXXVIII

A GOSSIP—TOOTHACHE AND EARACHE

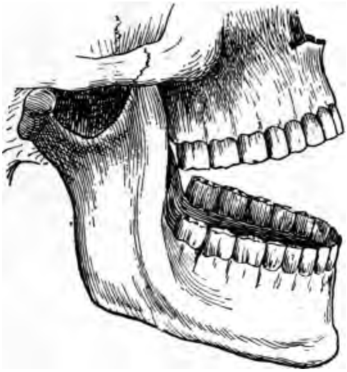
As the doctor's professional duties prevented him *from giving* the next lecture at the usual time of eting, Miss Brown thought it would be a good ortunity for her to bring her girls together for a le informal chat about w common, everyday . Accordingly, when y all met, she invited m to draw their chairs round the fire for a sip.

“The doctor has given some good advice th regard to a number serious ailments,” she gan. “Suppose we w turn our attention to a few of the minor, every-y troubles of life. What shall we talk about first?”

“Oh, let us begin with toothache please,” said rah. “Poor Mary Jones has been suffering from thache all the week.”

“Very well then,” replied Miss Brown, “let it be thache. Mary, I am sure, feels that there is no ed for me to describe the symptoms, and I daresay u all know something about them. Therefore, we ll go straight to the cause of the trouble.

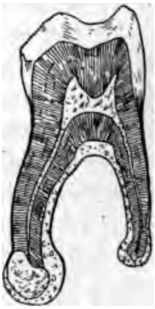
“The white glistening teeth, which every one is so ud of, have for their outside coating an exceedingly rd substance called *enamel;* but the main body of h tooth is a softer material called *dentine,* some-ing like ordinary bone. With proper care this amel is very durable, and will last a life-time, but it very brittle, and is liable to crack and chip with bad age. As long as the enamel remains perfect, there ed *be no fear of* toothache, but the least flaw in it leaves the dentine exposed, and that substance immediately begins to decay and break down.



"A very small opening in the enamel is sufficient to set up this decaying process within, so that it often happens that a tooth may appear perfectly sound to look at, although the inside may be completely decayed."

"I suppose," said Maggie, "the toothache itself does not begin until some part of the tooth is decayed and hollow; for I remember that the middle of the tooth is composed of a sort of pulp, which contains the nerves and blood-vessels."

"Yes, Maggie, you are perfectly right," replied Miss Brown. "It is when the inside of the tooth is eaten away, so that the nerve is exposed, that the least thing will bring on the tortures of toothache. The jar of eating, the least shock caused by taking anything hot or cold into the mouth, nay, even the inrush of cool air while speaking or breathing, is sufficient to cause the pain, until one's everyday life becomes almost unbearable.



SECTION OF A MOLAR TOOTH.

"Nor is this all, for gumboils and abscesses at the root of the tooth are frequently the result of the tation caused by the decaying process, and the ·ve of the tooth may communicate its trouble, in ıe mysterious way, to others in the vicinity, and give rise to neuralgia, in which case the whole side the face is usually affected.

"The doctor has shown us how necessary good th are for the work of digestion, and our own every- y experience has familiarised us with the tortures of ›thache, by seeing others suffer, even if we have t suffered ourselves. Therefore it behoves us to ep in mind his favourite motto, '*Prevention is better* *ın cure,*' and to avoid the risks of toothache by ing every care of these valuable servants of ours.

"If you want your teeth to last, do not use them nut-crackers, and do not bite all sorts of hard things h them, for by so doing you are very likely to chip enamel. Strange to say, however, hard usage like s is even less destructive to them than want of anliness.

"Small particles of the food are sure to cling ›ut the teeth, and lurk in the recesses between m after each meal. If allowed to remain there y will begin to decompose, and one of the products this decomposition is a peculiar acid, which eats its y into the hard enamel and so lays the foundation future trouble.

"You cannot too soon, therefore, acquire the habit rinsing the mouth out well after each meal, and ıshing the teeth regularly with a tooth brush every r. No doubt you have seen people use a pin or ıe such article, to remove particles of the food from teeth. This should never be done; a quill tooth- *k is the best instrument* for this purpose.

"So much then for *prevention;* now for the *cure* should toothache come, as it sometimes does in spite of care."

"Mother had one of my teeth '*stopped*' by th dentist when it began to ache," said Norah.

"Yes," replied Miss Brown, "that is the best ste to take when a tooth begins to decay. The dentis first scrapes away the decayed and decaying part o the tooth, and then fills up the hole either with gold or some sort of cement. A tooth treated in this way will often last for years.

"It must not be forgotten," she continued, "that toothache frequently arises from a disordered state of the stomach and bowels. If this is the case, the first step in the treatment should be to remove the cause of the trouble by giving the sufferer a little aperient medicine, and to follow this up with a few doses of some tonic such as quinine and iron.

"The toothache may be the result of cold, and in that case a flannel bag, filled with hot salt, and applied to the face, will often give relief. Some persons find relief by holding hot water in the mouth, and others strange to say, prefer to use cold water for the purpose.

"Carbolic acid is very effective in allaying the pain, but it requires to be used with extreme care, for if it is clumsily applied it will burn the mouth and tongue very badly. The best way is to apply it with a small camel-hair brush; or, if the tooth is hollow, to soak a little cotton-wool in the acid, and push it into the hole. Creosote and camphorated chloroform may be used in the same way, and there is less danger of burning than with carbolic acid.

"*In* every case extraction should be the very last resort, and should not be determined upon until all else has failed."

Norah here remarked that she thought earache must be quite as painful to bear as toothache, for she remembered her little brother Bob once crying all night long with it.

"Yes, Norah," said Miss Brown, "earache certainly is a very distressing pain. The cause of the trouble is always inflammation in some part of the ear, and usually arises through cold. The seat of the disorder may be in the inner ear, and if so it will require the skilled treatment of the doctor, and must in no case be neglected, or deafness may set in.

"It may, however, be due to inflammation of the outer canal of the ear, and in this case it requires only simple treatment.

"Sometimes a small boil will form in the passage, as a result of irritation caused by the foolish practice of picking the ears, to remove the wax which accumulates in them. Under these conditions the walls of the canal become very red and swollen, and after a time the boil bursts and the ear begins to discharge. This will give relief from pain, and the great aim should be to bring the boil to a head as soon as possible.

"The best way to do this is to apply warm poultices to the ear, and to pour warm water or warm olive oil into the passage with a spoon. If the head *is* held on one side, the water can be easily kept in the passage, and this should be frequently repeated, taking care to well dry the canal with a piece of cotton-wool each *time*.

"It is a good plan to syringe the passage, from

time to time as the discharge goes on, with warm water, in which a little sulphate of zinc has been dissolved. It should be carefully dried afterwards, and the passage should be plugged up with cotton-wool to keep out the cold.

"I must not leave this subject," she added, "without warning you against the insane practice of pushing things of any sort into the ear. The drum (the membrane at the inner end of the passage) is easily burst, and if that happens, it is a hopeless case of deafness for life."

Lesson XXXIX

Miss Brown Continues

"If I were to ask almost any assemblage of persons, irrespective of age or sex, to name the most troublesome of their common aches and pains," continued Miss Brown, "what answer do you think I should get from the majority of them?"

"Headache," cried several of the girls in one breath.

"Yes, I think you are right, girls," she replied. "That is why I intend to deal with headache next. There are many different kinds of headache, and they arise from as many different causes. Hence the treatment for one will not suit another.

"One kind of headache may be regarded rather as a symptom of a disorder, than as a disorder in itself. This is especially the case with what is commonly known as a 'bilious headache.' It is the regular ccompaniment of an impaired digestion, and particuarly of that kind which is due to a disordered liver nd bowels.

" The intense throbbing pains in the head are usually ttended by sickness, but it sometimes happens that vith all the feeling of nausea the person cannot be ick. In that case it is a good plan to take a simple metic, such as a tea-spoonful of mustard in a glass f warm water. This will induce vomiting, and thus elieve the nausea, after which an aperient medicine f some sort to stimulate the action of the stomach, iver, and bowels, will soon conquer the headache.

" Headache is also a constant symptom of constipaion ; and in this case again, the only way to relieve it is y bringing the bowels into more healthy regular action. ollow out carefully all the doctor's hints about ating, take plenty of open air exercise, and do all in our power to encourage the bowels into regular daily abits. In stubborn cases a dose of effervescent aline before breakfast will act as a stimulant, but this hould be continued no longer than is absolutely necesary to induce the regular habit of body."

"I have frequently heard mother complain of *ervous headache*," said Norah, "especially after she as had a busy day's shopping."

"Yes, Norah," said Miss Brown, "and these ervous headaches are very trying, for in addition to he dull heavy ache, there are sudden and severe hooting pains in the head. In this case we have a istinct disorder itself, and not the symptom of some ther derangement.

"Women and girls, especially if they are at all *elicate, suffer* from it more than men and boys.

Worry, the shock of some loud noise, any undue excitement, and too close application to study will bring it on. Hence it is that rest and quiet do more good than anything else; but the rest and quiet should be accompanied by some sort of nerve tonic. I myself have found much benefit from phosphorus pills.

"*Neuralgic headache,* which is another sort of nervous affection, is mostly due to cold. Indeed, if the system is out of tone, the slightest exposure is likely to bring it on. In such a case the system wants bracing up, and a daily dose of quinine is the best treatment.

"Bright light and noise of any kind are very distressing during all attacks of headache. The sufferer should be kept in a darkened room, and as quiet as possible. Linen cloths dipped in ice-cold water and vinegar should be applied to the head and frequently changed.

"There is another class of somewhat common ailments, such as *fainting* and *fits* of various kinds, which I am anxious you should understand," continued Miss Brown, "because, if you know how to deal with them, you may be of very great service. The worst feature of these attacks is their suddenness. They usually strike with little or no warning, and everything then depends upon the coolness and presence of mind of those who are standing by. For the sake of the poor sufferer, it is essential that we should know exactly what to do, and be able to keep ourselves cool and collected in doing it.

"Fainting is due to weak action of the heart, and may be caused by some sudden shock, or nervous excitement, or even by severe pain, which acts on the

rves and seems for the moment to make the heart
and still, so that the blood for a time ceases to
rculate freely.

"Short as that time is, however, the brain im-
ediately misses the usual flow of blood, and un-
nsciousness sets in. The sufferer falls to the ground
allid, limp, and motionless; while the skin, although
ld and clammy to the touch, is usually covered with
eads of perspiration.

"The best treatment is to lay the person flat on
e ground, with the head well back, for that will
duce the blood to flow to the brain again. The
othing round the throat and chest should be loosened,
d plenty of air-space should be given."

"I have sometimes seen people crowd close round the
rson who has fainted," said Maggie. "It seems very
oughtless, for they certainly do no good by looking
, and they must be keeping the fresh air from the
or sufferer on the ground."

"You are quite right, Maggie," replied Miss Brown.
f people would only think of what they were doing,
ey would never crowd up merely to satisfy their
riosity in such cases.

"Cold water should be sprinkled on the face, and
bottle of smelling-salts or ammonia applied to the
strils; and it is also a good plan to rub the chest
iskly with the hand, for this will often rouse the
rt into renewed activity.

"Recovery from the attack will be indicated by
light return of colour to the cheeks, and an im-
vement in the pulse and breathing, both of which
extremely feeble while it lasts. As soon as
patient is able to swallow, a little weak stimulant,

such as sal-volatile or brandy in water, should be given.

"*Fits and convulsions* are altogether different from these faintings, both in their nature and also in the treatment they require. They are a nerve trouble, and spring in all cases from some irritation of the brain or nerves.

"Infants during the teething period are very liable to convulsions, particularly if they are improperly fed. The mass of undigested material clogs the stomach, and acts as an irritant upon its nerves. They immediately convey the irritation upward to the brain and spinal cord, which at this time are naturally in a highly excitable condition, and so the trouble is brought about.

"When the attack comes on, the little sufferer usually turns a livid colour, and holds its breath, and either commences to twitch its face and limbs more or less violently, or becomes rigid all over, with staring eyes and distorted features. Coolness and presence of mind are very badly wanted at such times.

"Remove the clothing as quickly as possible, and place the child up to its waist in a warm bath, at the same time dashing plenty of cold water on its face and chest, and keeping cold linen cloths on its head.

"The doctor, I know, with his favourite motto, '*Prevention is better than cure*,' before him, would say to mothers, 'Correct the error in feeding the baby, and look carefully to its bowels, and you will do much to prevent this distressing affliction.'"

"I think it is very terrible to see a grown-up person in a fit," said Mary Jones.

"Yes, Mary, it is indeed," said Miss Brown. "The sufferer falls insensible to the ground, his breathing stops, and the body and limbs first become quite rigid, and afterwards begin to jerk in a violent and spasmodic way. The face, too, becomes swollen and congested, and twitches violently, the eyes rolling, and the teeth gnashing all the while. After a time the breathing usually returns with a gurgling sound, and the sufferer foams at the mouth.

"Painful as all this is to the watchers, little more can be done except to lay the sufferer flat on his back, loosen the clothing around his neck, and prevent him from biting his tongue during his twitchings by forcing a knotted handkerchief or a cork between his teeth. Cold water may be dashed over the head and chest, but no drink should be given while the paroxysm lasts, as it is liable to cause choking."

PART IV.—COMMON ACCIDENTS

Lesson XL

ANOTHER GOSSIP—BURNS AND SCALDS

One afternoon about a week later Miss Brown met Norah and some of the other girls on their way home from school; and after the usual greetings were over, she informed them that the doctor had written to say he would be unavoidably engaged that evening in another quarter, and that consequently the regular meeting at the Institute must be again postponed.

"*Therefore,*" she added, "we ourselves will meet as before without the grown-up people. I want to have a chat with you girls about a few of those common accidents, which are likely to occur from time to time in all households."

The evening arrived in due course, as did also the girls, and when they were comfortably seated, Miss Brown began.

"Now, girls," she said, "in making *accidents* the subject for discussion this evening, my purpose is to impress upon you, one and all, the absolute necessity for clear-headed presence of mind, because of the suddenness with which all these things happen.

"Presence of mind in the face of accidents of all sorts robs them of half their terrors. Indeed it probably prevents a bad accident from becoming much worse, and often saves lives, which otherwise would certainly have been sacrificed.

"This wonderful self-control, which we call presence of mind, is not a thing that can be called up by anybody and everybody at a moment's notice. It is an acquired power, which comes to individuals as the result of training; and nothing helps one so much in acquiring this power, as a clear knowledge of what is best to be done in each particular emergency. We may truly say in this case that '*knowledge is power.*'

"Try, if you can, to picture to yourselves what would be the result, in different homes, of some bad accident to one of the children. In one case the poor mother, utterly distracted for the want of knowing just what to do, catches up the injured, screaming child, and hugs it close in her arms, frantically calling *for help,* and crying 'My baby! my baby! What [illegible] I *do?*' But beyond this she seems, poor thing, be powerless herself to do anything of real good, hough every moment adds to the danger, and the tle life is perhaps slowly ebbing away.

“In the other case, the mother keeps herself comratively cool and self-possessed—not because she es her baby less, but because she knows just the ht thing to do, and she feels self-reliant. She ver loses her head, as we say; she knows what must done; she does it, and probably saves the dear tle life.

“Now if I were to ask you what you consider the st terrible of all accidents that can happen in a use, I think I know what you would say.”

“Fire,” cried several of the girls without a moment’s sitation.

“Yes, that is just the answer I expected, and it is ite right,” she replied.

“You no doubt remember my advice of last year, d if you think over it, you will at once see how solutely necessary presence of mind is in all fire idents. There is no time to think; one must be dy to act, and act instantly, or it will most likely too late.

“I have been thinking the matter over very iously, and I intend to practise you all from time time in a sort of fire-drill, in order to familiarise u with what you would be expected to do in case accident. I shall take special care each time that cry of fire! fire! comes when it is least expected, that you will have to act on the instant without y preparation. Girls and women are more liable to ident by fire *than* boys or men, because of the in- *mmable nature* of their clothing, therefore some one will be instructed to rush suddenly into the room calling for help, as if her clothes were on fire. I shall simply watch and see what you will do."

"I should rush out from my seat and throw her down," said one.

"But you would have to be careful, or your own dress might catch fire too," said another.

"Then we should all get coats, cloaks, and every kind of thick woollen articles we could lay our hands on, and throw them over her," said a third.

"And we should do our best to stifle the flames, by making her roll round and round on the floor, and by beating and pressing the thick woollen coverings with our hands," added a fourth.

"Capital, girls," replied Miss Brown, "you shall soon have the opportunity of showing me whether you can act as well as talk; but now we must leave *prevention* in order to consider *cure.*

"First and foremost then, let me say that in every well-ordered household, especially where there are children, there should always be a bottle of *carron oil* ready for instant use in an emergency. This is easily made, for it is merely *a mixture of linseed oil and lime water in equal quantities;* but it is a most effective dressing for burns and scalds of every kind.

"Should a person be badly burned, you must remember that the poor sufferer has sustained, in addition to the bodily injuries, a severe shock to the nervous system, for the multitude of nerve-endings all over the skin are all in direct communication with the *spinal*-cord and the brain. The shock itself is often *fatal.*

"*Therefore,* strange as it may appear, your first ty in such a case after extinguishing the fire must to endeavour *to soothe the poor sufferer's nerves, which ve been so much shattered by the effects of the shock.* y her flat on a bed or a couch, apply hot-water tles or hot bricks to the feet, and give her a little mulant, such as brandy and water, hot tea, or monia in water, to restore animation.

"This done, you should proceed to remove the thing, or what may be left of it, and attend to the rns themselves. You would probably find portions some of the burnt garments adhering to the injured n. If so, remember *they must not be torn away, or n cut away.* In every such case, cut the fragments clothing round with the scissors as close as you can the burn, apply lint or cotton-wool well soaked in rron oil, and cover up close with a sheet of wadding d bandages to exclude the air.

"Should the skin be blistered, the raised horny ver must not be cut away, for that will act as a otection to the parts beneath it, and greatly assist in e process of healing. The fluid inside the blister, wever, must not be allowed to remain, for it would ess upon the delicate tissues, and set up further itation.

"*Snip the blister at one corner with a pair of sharp ssors, and gently press out the fluid, before the dressing applied.*

"This is all you can do till the doctor arrives, but nember, if your part is properly carried out, you ll in all probability have the satisfaction of knowing at your prompt action has saved a valuable life, ich must have been sacrificed without it.

"*After the doctor* has taken the case in hand, you will of course be guided implicitly by his instructions. I am only concerned now in showing you how to act for the best should the emergency arise, so that you may not stand wringing your hands and crying in a helpless way, or else do something which is hurtful rather than beneficial to the poor sufferer.

"In slight cases of burns and scalds, where only the outer surface of the skin is injured, so that it is red, swollen and painful, the best plan is to hold the part (which is generally the hand) in cold water, or, better still, to hold it under the tap and let the stream of cold water flow over it. This will relieve the stinging pain, after which the injured parts may be bound up for a time in cotton-wool soaked in carbolic oil or carron oil."

Lesson XLI

WOUNDS AND BRUISES

"We will now turn our attention to a class of common everyday accidents," continued Miss Brown, "the mere mention of which will at once call up in your minds the recollection of some occurrence of a similar character, for these things are familiar in every household.

"Harry, for example, delighted with his new pocket-knife, is busily engaged making himself a boat, when all of a sudden the knife slips and — well, you know the rest. Baby tumbles over some stones in the garden and comes in screaming, with her little knees cut and bleeding; or perhaps Tom is brough home from the football field with a sprained ankle; or Fred gets a blow in the eye with a cricket-ball.

"Probably none of these accidents may be very serious matters in themselves, but they all mean work for mother or big sister. They must all be carefully attended to; but more than that, they require common-sense treatment, for even a slight cut, a bruise, or a scratch will quickly develop into a big, foul sore, and become the cause of much pain, if it is improperly treated at first.

"Suppose we commence with cuts. Wounds of this kind may be inflicted with a variety of instruments, and the treatment for one would not suit another. There is the clean cut, *incised wound,* made by the sharp edge of a knife; then there is the *punctured wound,* caused by a thrust or stab from the sharp point of some instrument; then there is the *lacerated wound,* in which the flesh is torn rather than cut, as it would be by the teeth of a saw; then again there is the *contused wound,* in which not only is the flesh cut, but the parts around it are bruised; and lastly there is the *poisoned wound,* where some poisonous matter is introduced into the flesh.

"In the case of a simple incised wound nothing more is necessary than to bring the edges of the cut together and *bind it up, in the blood,* with a clean linen bandage, and it will close and heal of its own accord. If the wound gapes open, strips of ordinary adhesive plaster, a quarter of an inch wide, will assist in keeping the cut edges together. The plaster requires to be warmed before a fire or a gas-flame, and it will then readily adhere to the skin on either side of he cut.

"This treatment, however, would be a complete failure with a lacerated or a contused wound. In both these cases the flesh on either side of the cut is torn and bruised, and practically beyond the power of repair. The particles of this dead flesh, as we might call it, must come away before the wound can heal. Strapping the wound up with plaster must not be resorted to in such a case.

"Instead of that it should first be carefully and tenderly bathed in a weak solution of iodine (a few drops of the tincture of iodine, enough to make the water a bright cherry colour). This will cleanse the wound, and tend to stop the bleeding at the same time. *Such a wound must not be bound up in the blood.* When the bleeding is arrested, and the cut has been examined to see that it is perfectly free from particles of foreign matter, it should be covered with lint or cotton wool soaked in iodine lotion, with an oiled skin over it to prevent the dressing from becoming dry, and then it should be bandaged up close but lightly, so as to avoid pressure. The wound will probably require redressing every two days, and this demands considerable care and tenderness on the part of the dresser, because all discharge must be cleared away each time by bathing the wound in warm carbolised or iodine water, before the fresh dressing is applied.

"A mere scratch from a rusty nail is likely to fester and become very troublesome, because of the foreign poisonous matter which is thus introduced into the blood. Such a wound, like the one we have just been discussing, should be well bathed and cleansed with a solution of iodine or carbolic acid before it is allowed to heal, and, should any festering take place, the disırge must be all carefully washed away, or blood soning may follow.

"Abrasions of the skin, which are a common source ɔhild trouble, are often made much worse than they ɪd be by carelessness in dealing with them at first. ɜ fall almost always takes place in the rough road- ɣ, or on the equally rough gravel path, and the aking of the skin is sure to introduce particles of ; and other matter, which if left there will just as ely cause the scratch to fester into a wound.

"Here again a weak solution of iodine, such as I have cribed, will do the cleansing work, and help to stop bleeding at the same time, after which the wound y be bound up with a piece of lint soaked in Dutch ps or Friar's balsam, which will quickly heal it.

"Let us next pass on to consider the nature and ıtment of bruises. Bruises may be caused by a , by a blow from some blunt instrument, or by ere pressure of any kind. They show themselves t by redness and swelling, and afterwards by discoration of the injured parts. We will see what ɜ discoloration means. The effect of the injury is damage and rupture all the small blood-vessels in vicinity—indeed, in a severe bruise even the large sels may be ruptured. The result of this is an flow of blood from the damaged vessels into the ıues, which thus become overcharged, and that causes swelling and discoloration.

"Bruises are of two kinds. In a simple bruise, hough there is swelling and discoloration, the skin nains unbroken; but in a bruised wound there is re or less serious abrasion of the skin, in addition to *deep-seated injury* itself.

"A simple bruise is easily and effectively dealt with, if we will take the trouble to consider what is the cause of it. The one thing necessary is to get rid of the overflow of blood in the injured parts. The damaged vessels must in some way be made to cease bleeding; the blood that is there must be carried off.

"Cold water is the best of all applications to arrest the bleeding, as it causes the vessels to contract. The very first thing, therefore, to do in case of a fall or a blow is to take the child to the cold-water tap and sponge the injured part well for two or three minutes. A cold wet linen cloth laid on the place for a second or two, and renewed again and again, will be very effective.

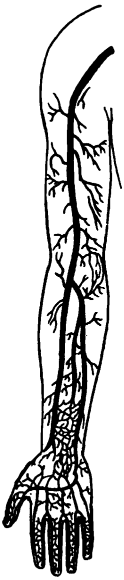
"A few minutes' bathing will be quite sufficient; then after a short rest it should be repeated, and later on some solution of arnica should be applied, as this is an astringent, and assists in lessening the escape of blood from the torn vessels.

"After the lapse of two or three hours, during which, of course, the person should rest quietly, the next business must be to get rid of the swelling, in other words, to get rid of the blood which has already flowed out into the tissues. This must all be absorbed and carried away into the circulation again by a set of vessels known as the lymphatic vessels, which form a system of their own in all parts of the body, on purpose to drain off surplus blood from the tissues.

"Warm applications are the best for this purpose, for the warmth stimulates the lymphatic vessels in their work of absorption. Therefore gentle sponging of the injured part with warm water, for a few minutes at a time, is found to be the most effective means of reducing the swelling and discoloration.

is the best of all treatment for such bruises eye, a sprained ankle or wrist, or any bruise skin is not broken. The popular notion as ɜacy of applying a piece of raw beef, a coin, le of a knife to a black eye is fallacy, except act that they are cold when first applied.

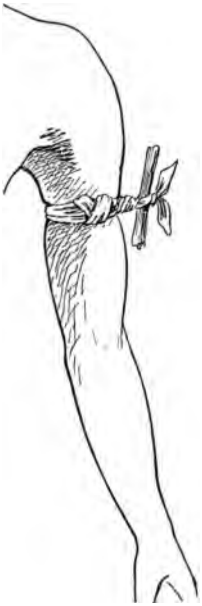
ould be carefully borne in mind that, in the simple bruise, the unbroken skin forms a to the injured parts beneath. Where there sion of the skin, in addition to the deeper- uise, matters assume a more serious aspect, ie injured tissues are then open to attack ospheric agencies, which may trefaction. In the treatment of ses *arnica must in no case be*



mnection with this I ought to against the exploded remedy of lancet or leeches to a black is method of treatment really he trouble by puncturing the thus making a wound; and at the leech will always reject d blood in the tissues, while it blood from the vessels around, serves no purpose whatever.

is one other matter—a most one—which we must not lose connection with wounds and In all simple accidents the cut ly the capillary vessels, or at very smallest veins. But a more severe cut *likely* sever one of the larger veins or arteries, and then the bleeding becomes a much more serious affair.

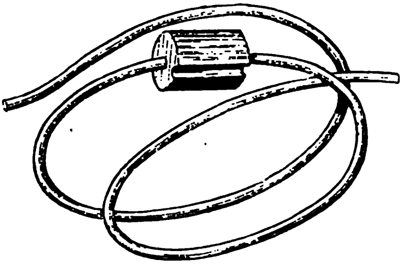
"If a vein is cut, the blood will ooze or trickle out in a slow continuous stream; but *it spurts out in jets from a wounded artery.* The blood from a wounded artery, moreover, is bright scarlet, while that from a vein is of a dark purplish hue, so that there is no difficulty in telling which it is.



"It is sometimes necessary to use artificial means to stop the bleeding in both cases. A simple way of doing this is to tie a large knot in a handkerchief, place the knot in such a position that it must press the bleeding vessel, then tie the ends of the handkerchief firmly together, force a stick of some kind between it and the limb, and twist it round tightly.

"Remember only that, in the case of a wounded artery, *the blood is coming from the heart,* and consequently *the knot must be placed on the side of the cut nearest to the heart;* whereas in the case of a wounded vein the *blood comes from those parts of the body remote from the heart,* and *the pressure must be applied on that side of the cut.*

"The handkerchief and stick form a rough-and-ready aid which you can use at any moment. Medical men have a more elaborate appliance called a *tourniquet which they* employ for the same purpose; but my only *object* now is to show you how to help yourselves and those around you in an emergency till proper medical help can be obtained."



A TOURNIQUET.

PART V.—INFECTIOUS DISEASES

Lesson XLII

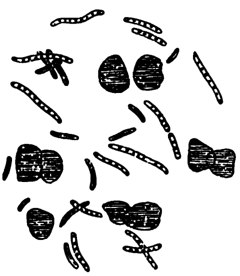
An Invisible Foe

It was a full meeting at the Institute, for the doctor had taken care to make it known, that he was about to open up a new and most instructive subject for discussion that evening.

"I must ask you to give me your undivided attention now," he said, looking round upon his audience, "for I want to teach you how to grapple successfully with the most terrible of all the enemies to human life, and even how to conquer them and lay them low.

"The enemies to which I refer are *Infectious or Catching Diseases.* The reason why they are so much more terrible than other diseases is that, like a lurking assassin, they strike their victims down, when they are least suspicious of danger, and an invisible foe such as *this is always the* worst of enemies to meet.

"Let me explain what I mean. These diseas (among the commonest of which are *small-pox, chicke pox, measles, scarlet fever, typhoid fever, diphtheri cholera,* and *whooping-cough*) are all due to livin germs, which learned men call by various names, suc as *microbes, bacteria, bacilli,* and so forth.



"So exceedingly minute are these disease germs that not only are they invisibl to the naked eye, but it requires the aid of the most powerful o microscopes to detect them at all Even when seen under a microscope, which magnifies abou 4000 times, some of them appea no bigger than the commas in piece of ordinary print.

"They swarm in the air, an hence find their way readily into the water we drink as well as into milk and other articles of food. Th very clothing we wear serves as a vehicle for carryin them about, and transmitting them to others.

"I think the most marvellous thing about thes germs is the unparalleled rapidity with which the grow and multiply, for it has been calculated that i twenty-four hours, one of them is capable of developing no fewer than sixteen-and-a-half millions.

"They belong to the vegetable world, and a members of the same class of organic bodies as th well-known yeast plant, both being representatives the lowest form of vegetable life. You all know tha the yeast plant grows by a peculiar process of its ow *which* we call fermentation. If you remember that, *will help* you to understand how these disease ger grow in our bodies, for the process is precisely the same.

"This will explain why we medical men speak of the diseases, which these germs produce, as '*zymotic diseases.*' The word itself comes from a Greek word '*zymosis,*' which means *fermentation.*

"There are two things to remember in connection with the growth of these disease germs. The first is that the germs themselves, like all other germs, are actual seeds. No gardener would expect to find cabbages spring up and grow from onion seed, or onions from cabbage seed, because onion seeds produce only onions, and cabbage seeds only cabbages. It is precisely the same with these disease germs. Each disease springs from its own special germ, and from no other. That is to say, scarlet fever germs can produce scarlet fever, but not diphtheria, or typhoid; diphtheria comes only from diphtheria germs, typhoid from typhoid germs.

"The next thing is that these germs, like all other seeds, must have a suitable soil in which to grow and flourish. You all know what would be the result, if you sowed your garden seeds in sand, or sawdust, or dry ashes, instead of proper mould. The seeds, of course, would die, and even if one or two struggled into feeble existence as little plants, they would quickly wither and perish for want of nourishment, before they reached anything like maturity.

"These disease germs, being seeds too, must, in like manner, find a suitable soil in which to grow and multiply, or they will themselves die, before they are able to produce actual disease. Dirt and filth of all kinds, decaying vegetable and animal matter—these *are the suitable* soils in which disease germs grow, multiply, and flourish; these are the nursery beds in which the *'invisible foe'* is nurtured and reared to maturity, to issue forth in countless millions for the wholesale destruction of life.

"This does not mean, as people once thought it did, that the disease actually springs in the first instance from filth and dirt, for clever men have exploded that idea. Germs of small-pox, scarlet fever, measles, or diphtheria, are always the offspring of parent germs of exactly the same nature, and must have been bred originally in the body of some person suffering from the particular disease. Indeed it is altogether impossible for them to be developed in any other way.

"But although they are not actually produced from filth, yet wherever filth exists, there they make their home, pouncing down upon it like vultures on carrion, only in infinitely more countless multitudes, and there they live and thrive and multiply, till they are ready to issue forth on their deadly work.

"The great thing to remember is that, although these disease germs may be in the air, they are powerless to multiply or flourish there. This they can do only in their congenial soil of dirt and filth.

"Oh, if people only understood this better," continued the doctor, warming up to his subject, "if they would only learn to distinguish friend from foe, to welcome God's fresh air with open arms, and fight with might and main against their deadliest enemy, dirt and filth, what a different world this would be.

"Suppose now we bring the matter closer home, *and think not* of our surroundings, but of our very *selves*—*our* own bodies. What will you think if I ll you that we all swallow hundreds of living germs ith every breath we draw? Yet it is perfectly true, r there are always present in the atmosphere vast ultitudes of germs of various kinds, which act as ature's scavengers, wherever putrefaction or fermen-tion is going on.

"You must bear in mind, however, that these germs e absolutely powerless to harm us. It is only the ecial germ, which has been bred from some special sease, that is able to set up disease in our bodies. ut strange though it appears, even these very disease rms themselves may, and often do, find their way to the body without producing the disease there. In ch a case they are unable to thrive and produce tual disease, because they find no suitable soil in the ody for their nourishment.

"Personal cleanliness and a regular observance of e Laws of Health are the best security against all ese disease germs, because the body nowhere affords em a suitable resting-place, in which to grow and ultiply, and they pass away without doing any harm. his explains why a healthy person is able to resist sease, while another whose system is out of tone sily falls a victim to whatever is prevalent around m."

Lesson XLIII

Fighting the Invisible Foe

"It is clear therefore," continued the doctor, "that l *'catching'* or *'infectious diseases'* spring from their own special germs, which are able, under certain conditions of the body, to find a resting-place in it, and suitable soil, so to speak, in which to grow and flourish.

"This being the case, you will not be surprised to learn that, the disease does not show itself immediately the person becomes infected. The poison germs require a certain time to develop, after they have settled in the body, just as eggs require a certain time to hatch, before they can develop into actual living birds.

"It is this very idea of the hatching of eggs, which has given the name to the interval that elapses between the time when the infection is caught and the time when the person shows signs of the disease itself. This interval is known as the *period of incubation*—*incubation* being another word for *hatching*—and during this period the germs are hatched, or developed, in the body into actual disease.

"The period of incubation varies from 4 to 21 days according to the nature of the disease. Thus in scarlet fever it occupies from 4 to 6 days, in measles and small-pox from 12 to 14 days, while in typhoid it sometimes extends to 21 days.

"You know already that the disease grows in the body by the rapid multiplication of new germs from the original, so that during its progress many millions of germs are produced, of exactly the same nature as the parent germs from which they spring. These germs are constantly given off, with everything that leaves the patient's body—from the lungs, the skin, the kidneys and the bowels—and they will quickly poison the air we breathe, and the water we drink, and so spread the disease among fresh victims, unless something is done to check them in their deadly work. Hence you see it is these invisible germs themselves which we must fight, if we wish to stamp out the disease.

"We speak of all these '*catching*' diseases as *infectious* or *contagious;* and I may here remark that the two words now mean practically the same thing, although when they were first used, *contagious* referred only to certain diseases, which were supposed to be catching by actual contact, *infectious* to those of another kind, which are breathed in or swallowed, as it were, from the atmosphere.

"Now it is quite within our power to rob these terrible diseases of their sting, if we will only use the means at our disposal; but people too often, either through ignorance or carelessness, or both, neglect to take the proper precautions for checking the invisible foe in time, and consequently it is left free to spread havoc and death all round.

"For instance, a single case of disease breaks out in a certain locality, usually of course the dirtiest, foulest, and most overcrowded part of the town, and in a very short time it spreads insidiously through the whole district, claiming fresh victims every day, till at last no one feels safe.

"Care in dealing with the outbreak at first might have limited the trouble to that single case, but no proper precautions are taken, the disease germs are allowed to escape into the air, and once there they become a constant source of danger to everybody in the neighbourhood. The one case thus becomes the breeding ground of many fresh cases, till the disease is prevalent *throughout the whole* district. Such a visitation we call an *Epi-demic*—a learned term which comes from two Greek words *Epi* = *upon*, and *demos* = *the people.* The disease is truly *upon the people.*

"Happily, things are not so terrible in this respect now as they once were, for the Government, recognising the common danger which these outbreaks mean to all alike, have empowered the authorities of every town and village in the country to take steps themselves to prevent the spread of these infectious diseases, instead of leaving everything in the hands of the careless and ignorant, to the peril of the whole community.

"Let us now consider what these precautions are, which the State takes for the safety of its citizens. In the first place, every district has its own medical officer of health, to whom each case of infectious disease must be immediately notified. It has also its small-pox and fever hospitals for the admission and treatment of patients, on the authority of the medical officer, in order that they may be isolated from the rest of the family.

"In the case of the poorer part of the community, where there could be no possible means of isolation, the law absolutely compels the removal of the patient to a hospital; but those in better circumstances, who can provide a sick-room, conveniently shut off somewhere at the top of the house, so as not to endanger the health of the rest of the family, are allowed to keep the patient at home.

"I am sorry to say there is often a good deal of senseless and unreasonable opposition to the hospital on the part of poor people. They forget that it is the *best of all* arrangements, both for the sick patient, and *also for the* whole family—indeed, I may say, for the hole neighbourhood. The mother, with all her love d tenderness, could not possibly expect to cope with e disease as successfully as a skilled nurse, especially der her cramped conditions for room. She would n terrible risks of losing her child; but the trouble ould not end there, for the infection would be almost re to spread, and strike down fresh victims, not only nong the other members of the family, but in the milies all round them.

“Much mischief has been done in times past through norant people trying to hush up some case of fection in the family, while they themselves have en going about, and mixing with their neighbours, d probably riding in public conveyances, just as if othing were wrong at home.

“These people could not help carrying the germs of fection about with them wherever they went, and so e disease was rapidly spread broadcast. But happily r the community at large all this is now made unishable by Act of Parliament.

“Where there is any suspicion of infectious disease, e sick person, whoever it may be, should be kept art from the rest of the family, and carefully watched a few days. You have only to remember what I d you about the period of incubation, and you will once see the reason for this. If disease germs have nd their way into the body, they will take their al time to develop into actual disease, and by ping the person *in quarantine,* as we call it, the t of the family may be saved from infection, should suspicion become a reality.

“Many of these infectious diseases attack children re *frequently* than grown-up persons, and hence there is a foolish notion prevalent among some people that their children must have such-and-such diseases some time or other during their childhood. The result of this silly idea is that, they are not nearly careful enough to protect their little ones from infection.

"Indeed it is not at all an uncommon thing for a mother of this kind to let her children mix freely with others, that are suffering from some disease, because, as she says, 'They are bound to have it sooner or later, and as this is a mild case, they may as well have it now.'

"Nothing, however, could be more unwise, for, in the first place, with proper care there is no reason at all why a child must take any of these diseases; and secondly, it should always be remembered that, a mild form of disease in one child often produces the most virulent and fatal cases in those who catch its germs."

Lesson XLIV

INFECTION AND DISINFECTION

"Let us now consider what weapons we have at our disposal for fighting this invisible foe," resumed the doctor. "Our most effectual weapon of defence, as I have already observed, is cleanliness—cleanliness in our own person and clothing, cleanliness in our homes, cleanliness in our drainage arrangements, cleanliness in the water we drink, and cleanliness in the air we breathe, or in other words proper ventilation in all our rooms. These, together with *temperate* living, are our best security against any *outbreak* in our own homes, for—let me once more peat—the foe revels in dirty, unhealthy surroundgs, but is comparatively powerless in a clean, healthy ousehold.

"Whilst speaking of this I ought to clear up a oint, which is rather vaguely understood by the ajority of people. Sewer gas in itself cannot prouce any of these special diseases, for you know each ne comes from its own special germ. It is only ossible for defective drains to be the direct means of inging disease into the house, if the germs of that articular disease have been cast into them from some ther infected house. In other words, the germs do he mischief, not the sewer gas.

"When the drains are in an unsatisfactory condition, so that sewer gas rises from them into the ouse, there may or there may not be fever germs in t. Granted, however, that the gas found in some ouse does not happen to contain any of these germs, et the inmates of the house, by constantly breathing he contaminated air, become so weakened in their eneral health, that they fall an easy prey to the erms of scarlet fever, measles, typhoid, diphtheria, mall-pox, or any other fever that may chance to ttack them.

"Unfortunately, careful as we may be ourselves, e can scarcely hope (such is our experience of human ature) to find everybody around us equally careful. We shall always have careless, dirty, indolent, and nprincipled people about us, and so we are to some xtent at the mercy of our neighbours.

"Carelessness on the part of some, in allowing rags, ouse-flannels, and other improper things to get into he drains, will be sure to cause a stoppage somewhere, to drive the sewer gas back, not only into their own houses, but most likely into those adjoining them as well.

"Then again, some people, in spite of Acts of Parliament, will continue to leave their infected homes, and mingle with the outside world, as if there were nothing the matter. Some, for the sake of gain, will keep their shops open, while disease is secretly raging in the family, and in this way the very food we eat, and the articles we purchase for our use, are liable to convey to us germs of infection. Even the letters which the postman leaves at our door may come from an infected house, and be the means of spreading the disease.

"Happily, wherever there is the least suspicion of danger, we have a ready means of protection at hand in the shape of *disinfectants.* Indeed, just as cleanliness is a powerful weapon of defence, so disinfectants are equally powerful weapons of attack, for by them we are able to actually *destroy the germs themselves,* before they can gain an entrance into our bodies, and thus we prevent the disease from spreading.

"We will now proceed to discuss the various substances used as disinfectants. They all *disinfect,* or *destroy the infection,* as I have said, *by destroying the germs themselves*—the germs cannot live in their presence. The disinfectants most widely used are carbolic acid, Condy's fluid, Burnett's fluid, sanitas, chloride of lime, sulphate of iron (commonly known as green vitriol, or copperas), sulphuric acid, or oil of vitriol, spirit of salt, and sulphur—and these all have *their special* uses.

"*Thus* the fumes from *burning* sulphur are the very best of disinfectants for a room, but the room must be unoccupied, for those deadly fumes would destroy not only the germs, but the patient as well, if he were in t. Then again, green vitriol is a valuable disinfectant for cleansing the bed-pan and other utensils, as well as the water-closet and the drains, and so are spirit of salt, and oil of vitriol; but they cannot be used for other purposes, because the green vitriol stains loors and iron-moulds linen, and the other substances are so powerfully corrosive in their nature that, hey would destroy whatever might come in contact with them.

"*Chloride of lime* is useful for many purposes, and t has the advantage of being cheap. It may be safely used in solution for disinfecting clothing and linen of ll sorts, but the articles must not touch the chloride f lime itself, for that would burn the material. The olution should be allowed to settle, and the clear water only should then be poured off for use.

"*Carbolic acid*, *Condy's fluid*, and *sanitas* are the est of all the disinfectants for every purpose connected with the patient, the wearing apparel, and the bed-lothes.

"*Carbolic acid*, all things considered, is the most aluable disinfectant we have, but care is required in sing it, for it is very poisonous. It must never be sed in its concentrated form, as it is supplied over the counter, for it would burn the skin, and destroy extile materials, especially those made of wool. Diluted with about thirty times its own quantity of water, it makes a useful and harmless disinfectant for all sick-oom purposes. It may be then sprinkled about the *oom with impunity*; the floors may be washed with it, and the soiled linen may be steeped in it before it is taken away.

"*Condy's fluid*, which is simply a solution of *permanganate of potash*, is valued in the sick-room because, unlike carbolic acid, it possesses no pungent odour. You may make it for yourselves at very little cost, for an ounce of the crystals can be obtained for three half-pence, and this dissolved in three pints of water will make a strong solution, which can be bottled close and kept for a long time. The strong solution itself must not be used, for it would turn the skin and the linen brown. In using it, pour enough of the liquid into a basin to make the water a bright colour, and it will do all that is required.

"*Sanitas* is highly recommended for use in the sick-room, because it is not poisonous or corrosive, does not stain, and it possesses a pleasant and refreshing odour. It is more volatile, too, than most of the other disinfectants, and is therefore valuable for sprinkling about the room, or for use with a spray. It is made from oil of turpentine.

"Both Condy's fluid and sanitas are, properly speaking, *antiseptics* rather than *disinfectants*. Let me explain the difference. *A disinfectant* does its work *by actually destroying the disease germs*; *an antiseptic does not destroy them*. It makes them powerless for evil for the time being—that is all. When the influence of the antiseptic is removed, the germs are free once more to act.

"The usefulness of an antiseptic lies in its power *to arrest* the growth of the germs in and about the *sick-room* itself. *Nothing but a disinfectant of the proper sort will actually destroy them.*

carefully reading through these rules one by one. They will tell you exactly what steps you must take in every case of infectious disease, in order to benefit the patient, and also to prevent the infection from spreading.

"1. On the first suspicion of infection the patient should be placed in a separate room, as far removed as possible from the rest of the family, and carefully watched. If incubation of fever germs is going on, the symptoms will soon begin to show themselves, and then the doctor must be called in.

"2. The sick-room itself should be kept warm, but that does not mean that it is to be close and stuffy. The temperature should not be lower than 60°, nor higher than 64° or 65°, and there should be free ventilation without draughts. In other words, the room must be airy as well as warm.

"3. All carpets, curtains, and drapery of every kind, and all articles of clothing, must be at once removed from the room. All pictures must be taken down from the walls, and removed too. Nothing in the way of furniture but what is absolutely necessary should be allowed to remain. A table and a wooden chair would be quite sufficient, but under no conditions must a stuffed chair or a sofa be left in the sick-room. Toys for young children, and books and papers for those that are older, need not be excluded from the room: but they should never be allowed to leave it again. They must all be rigorously destroyed, for otherwise they would be a fruitful means of spreading the infection.

"4. The door should be kept closed, and a sheet wet with carbolic acid should be hung across it on the outside, to isolate the room still more completely from the rest of the house. The acid for this purpose should be diluted with twenty times its quantity of water, and the sheet should be soaked in it, and wrung out before it is hung up. It is a good plan to stand a vessel filled with the solution on the floor, in such a position as to allow one corner of the sheet to dip down into it. The liquid will travel up the material by capillary attraction, and so keep the sheet always wet, without the trouble of sprinkling it afresh day by day.

"5. There should be an ample supply of disinfectants for use in the sick-room itself. Condy's fluid, sanitas, or a weak solution of carbolic acid will be required, for sprinkling or spraying about the room from time to time, and for disinfecting cups, plates, and other utensils used by the patient, for, of course, these things must not be sent out of the room till they are disinfected, and even then they will require to be well washed in boiling water afterwards.

"There must always be ready to hand some suitable disinfectant for use in the bed-pan, and some more in a vessel close by, to receive everything that comes from the patient, in the shape of spit, vomit, and other discharges.

"No food or drink left by the patient should, under any circumstances, be given to the rest of the family. It must all be thrown into a pail, with a solution of carbolic acid or chloride of lime, before it is taken out of the room, and all handkerchiefs and towels, and the bed and body linen when changed should be similarly treated.

"*6. No one* should be allowed to enter the room except the nurse and the medical man. The food, drink, and other things required should be left outside the door, and the nurse should not open the door to take them in, till the person who brings them has gone away.

"7. Under no circumstances should a cat or a dog be allowed in the sick-room, for they would be sure to carry away the disease germs in their coats.

"8. The nurse should always wear a cotton dress, because in the first place it can be changed and washed from time to time, and, besides that, it does not harbour the germs so readily as a woollen material.

"She should keep her hair neatly and closely twisted up, because that too affords a ready harbour for the germs, and for the same reason she should wash it now and then with a weak disinfectant of some sort.

"She should be careful to wash her hands in water and disinfectant, and especially to clean her nails, after attending to the patient.

"The mother has very frequently to act as nurse, and to attend to her household duties as well, and under such circumstances she must exercise every possible care, or she will soon have more than one patient on her hands. She should always take off her nursing dress before leaving the sick-room, and have another hanging just outside the door, to put on in its place before she goes downstairs, and even then she should mix as little as possible with the rest of the family.

"In all cases it should be one of the chief duties of everybody in the household to see that the drains are kept well flushed, and the house itself properly cleaned and ventilated while the illness lasts, for this will do much to prevent the infection from spreading.

"9. When the sickness has run its length, and the patient is approaching convalescence, the nurse must not imagine that all danger is over, for this period is often a more treacherous one than that which the patient has passed through, both for himself and also for those around him.

"Every care must be taken to prevent the convalescent from mixing too soon with the other members of the household; and even when the doctor gives his permission, the first essentials must be a warm bath with a disinfectant in it, and a complete outfit of clean fresh clothes, which have had no connection with the sick-room.

"10. The last part of the disagreeable business is he disinfecting of the sick-room itself, and this must e proceeded with, immediately on the removal of the atient.

"The only effective way of doing this is to close up ll openings in the room, such as the fire-place, indows and door, and then fumigate it with sulphur. his, like everything else, requires care. Stand a ay of water in the middle of the floor, as a safeguard gainst fire, and in this set an old iron saucepan, ith a shovel-ful of red-hot coals in it. Then pour n the top of the coals a sufficient quantity of sulphur roken up small, and immediately hurry out of the om, and close the door securely. The fumes from he burning sulphur will fill every crack and cranny n the room, and no disease germs can live in that eadly vapour. A pound of sulphur will be sufficient o thoroughly disinfect a room, which measures ten eet every way; and when the fumes have all gone, e *paper must* be stripped from the walls, and the walls themselves, the ceiling, and the floor well washed with a disinfectant. After this the workmen may repaper and whitewash the room, and there need be no further fear of infection.

"Of course the bed and bedding must also be thoroughly disinfected, but this part of the work is always undertaken, free of charge, by the Sanitary authorities, as it could not be satisfactorily done at home. Everything of this nature is taken away in a sort of closed truck, and after being subjected to the heat of the disinfecting oven, is brought back to the house, purified and wholesome once more."

Lesson XLVI

Some Infectious Diseases

The doctor had originally intended to close his lectures on the infectious diseases with the distribution of those cards of practical instructions. But Miss Brown persuaded him to say a few words about some of the commonest of them, because, as she remarked, "although the treatment of these diseases is essentially the doctor's work, yet I want my young people to know something of the nature of each, in order that they may be able to carry out their instructions intelligently, should they ever be called upon to act in the capacity of nurse."

In reply he said that he thoroughly appreciated the wisdom of her remarks, and would at once proceed to give them a brief description of the nature of a few of these diseases.

"In the first place," he began, "I may say there are two distinct classes of infectious diseases. In one the fever is always accompanied with *a skin eruption, or rash*; in the other *there is no rash*. Among those attended *with a rash* are scarlet fever, typhus fever, typhoid fever, measles, and small-pox. Diphtheria, influenza, and whooping-cough *have no rash*.

"*Scarlet fever* is extremely infectious. It attacks children more frequently than grown-up people, but this is probably because one attack, as a rule, protects the individual against a second. In other words, the fever very *rarely attacks the same person twice.*

"The period of incubation lasts from 4 to 6 days, and the first symptoms are headache, sore throat, and thirst. After a day or two a scarlet rash makes its appearance on the chest, neck, and face, and increases in intensity during the illness, till it covers the whole body.

"Under favourable circumstances the fever runs its length in about 10 days, and then the scarf-skin all over the body commences to peel off in scales and flakes. The peeling of the skin continues for the next 4 or 5 weeks, and during this period there is more danger of infection than at any other time, because the loose particles of skin are likely to be scattered through the air, and so spread the disease germs broad-cast.

"The risk of spreading the infection may be greatly diminished, by rubbing the body all over with carbolic oil once a day, till the shedding period is over.

"It must be remembered that the patient, although apparently quite recovered, is not fit to leave the sick-room, and mingle with the other members of the family, while there is the smallest shred of loose skin on the body, and even when the shedding is all over, proper precautions in the shape of disinfection must be taken.

"There is a mild form of this disease known as *Scarlatina*, which from its very mildness is often the cause of serious consequences, owing to the ignorance of those who have to deal with it. Remember, *scarlatina is really scarlet fever*, although in a mild form. It is not only equally infectious, but the infection from it is very likely to set up in another victim a most malignant and fatal type of the disease. For this reason, therefore, scarlatina should always be treated with as much care and attention, as you would give to a more pronounced attack of the disease.

"In its most malignant form the disease is so rapid in its action, that the rash never appears, but seems to be suppressed or driven inwards, and in such a case the result is rapid, certain death. I have often known similar results to follow even a mild attack, owing to the ignorance and gross carelessness of the mother, when the disease first showed itself.

"*Measles* is another very common disease among children, but it rarely attacks grown-up people. The reason is that, those who take the disease during their childhood are, as a rule, *made proof against any further attack*. Like scarlet fever it is highly infectious, and thus one case is likely to produce many more, unless great care is taken.

"This disease is spread more frequently than any others through carelessness and want of thought. Grown-up people, because they themselves have had *the disease* in their childhood, and are not likely to take it again, are apt to think far too lightly of it. Mothers of families will often not hesitate to visit the sick child of a neighbour, although if they but knew it, they run a great risk of carrying away the measles-germs in their clothing, to infect with the disease the inmates of their own household, and perhaps others besides.

"The period of incubation lasts from 12 to 14 days, and the early symptoms resemble those of ordinary catarrh, for the eyes are red and watery, and there are frequent fits of sneezing. As the fever advances, a rash, consisting of red, raised spots or pimples, begins to show itself, first on the chest and neck, and afterwards over the whole of the body.

"When the rash comes well out, there need be little fear with a healthy subject; but the great thing for the nurse to remember is that, the child must from the first be protected against draughts and chills, for if the rash is suppressed or driven inwards, there is very little hope of recovery, and even after the fever has subsided, want of care in this respect may bring about many serious complications.

"*Typhus* is known among medical men as essentially a filth fever. It is in an especial sense *the* disease of the foul, badly ventilated slums, in which the very poorest part of the community are to be found, although of course it is not absolutely confined to these quarters, and it seizes more victims in the winter than in the summer, because the inclemency of the weather forces these poor creatures then to crowd together for warmth, even more than usual, in their close dirty rooms.

"It is very infectious, but unlike scarlet fever and measles, the poison germs are given off *in the breat* *only*, and not from the skin. The air, which has bee fouled by the patient's breathing, is capable of conve ing the disease to others; but fresh air seems to r these germs of their power for harm, and hence it i that free ventilation of the sick-room is the best security against catching the infection.

"This explains in the first place why the disease holds such sway in the dirty, overcrowded slums of our large towns, and secondly, why the infection cannot be carried about in the clothing from place to place. The fresh air seems to destroy the germs of this disease.

"*Typhoid fever* is a disease of the stomach and bowels, and hence it is also known as *gastric fever*, and *enteric fever*. It has no connection with typhus, although the two names are somewhat alike. The poison germs of typhoid are given off, not by the breath or the skin, but *by the bowels.* Hence, in dealing with a fever case of this kind, the bed-pan should never be used without a sufficient supply of disinfectant, in order that all discharge that leaves the patient may be thoroughly disinfected, before it is cast into the drains. The closet-pan, and the drains themselves, should be frequently disinfected, and flushed too with abundance of water, in order that the poison germs may be at once destroyed, for they live and multiply in sewage, just as other germs live and multiply in foul air.

"It is when proper precautions have been neglected and the germs have been left unchecked, that danger arises among the community. Some of this germ-laden sewage may find its way into the water-supply of a town, and such water taken into the stomach is a sure cause of infection.

"The present year (1897) will be long remembered by the afflicted people of Maidstone, among whom this disease, due in all probability to contaminated waters, is now raging, for it has already attacked thousands, and the mortality arising from it, as an epidemic, is terrible.

"I need say nothing about the treatment of the lisease here, for it demands the highest medical skill; ut I may give you one warning in case of a similar isitation. Remember, these germs, like all others, are lestroyed by boiling. *Therefore boil every drop of vater you use, should an outbreak occur.*"

Lesson XLVII

SMALL-POX AND VACCINATION

"The last of the infectious diseases, which I propose o discuss here," continued the doctor, "is that much readed scourge, *small-pox.* I call it a scourge dvisedly, and for many reasons. In the first place, t is more deadly in its ravages than any other disease, or it has carried off more victims probably than even he plague itself.

"Then, too, it is terribly infectious, and strikes own old and young, rich and poor, without distinction, for its poison germs spread themselves through alace and hovel alike, so that the prince in his plendour is as liable to attack, as the beggar in his *lth and rags.*

"The disease itself is loathsome in the extreme, for during the attack not only are head, hands, and feet—every part of the body—swollen to a hideous, unnatural size, but the skin is covered thick with horrible pustules, the discharge from which gives out a disgusting stench. As it runs its course, too, the high state of fever throws the poor sufferer into violent delirium, which is likely to last, off and on, from the fifth day to the fourteenth.

"More often than not, death occurs during this period, or else it results from the state of sheer prostration, which follows the return to consciousness.

"Even though the patient may be strong enough to battle with the fever and survive the attack, it malignantly leaves its cruel marks indelibly printed upon the features, for when he is once more in a fit state to rejoin his fellow men, he finds himself disfigured for life, and oftentimes left hopelessly blind into the bargain.

"This is a faithful description of the disease, wherever it is left to pursue its deadly way unchecked; and this represents the invariable course it took with its victims everywhere, till science stepped forward and pointed out the only effective way of conquering it.

"Much is written in history of the ravages of the plague, yet terrible as its visitations must have been while they lasted, it should be remembered that each outbreak was usually separated from its predecessor by a long interval of time, during which the people were safe from attack.

"From the ravages of small-pox, however, no one was safe at any time; indeed in Persia and China, and ıer places in the East, it was so common that l escape it. Even in Europe itself, till withmodern times, it was estimated that no fewer millions of people were swept away by its ›very century.

v let us see in what way science has come ıs the saviour of poor suffering humanity. In place I may state that, with this disease as ›t of the others we have discussed, it was long d from experience that *one attack, as a rule, the survivor against a second.* The people ast were the first to discover this, and it was ›n practice in those parts to deliberately insert l-pox poison taken from one who was suffering › disease, into the skin of healthy persons, in ıt they might take the infection.

vas found that those who purposely contracted x in this way, always suffered from a milder the disease, and ran less risk of fatal con›s, than those who caught the infection in the way.

English lady, Lady Mary Wortley Montague, avelling in the East, became acquainted with ›tice in Constantinople, and on her return to ıntry in the year 1721, introduced it here he name of *inoculation.* From that time to of the last century *inoculation* was practised r in England, with very good results on the or even if persons so inoculated afterwards disease in the ordinary way, it was always in r form, and deaths from it were much less

.

' *grave* objection to the practice of inoculation was that while the inoculated person was undergoing this mild form of the disease deliberately inflicted, he was a constant source of infection to those around him, and the infection from him was capable of setting up disease of a malignant type in others, and even of originating an epidemic. *Inoculation, therefore, was never a complete success.*

"Things went on in this way, however, till the year 1798, when it fell to the lot of a very clever surgeon, Dr. Edward Jenner, practising in Gloucestershire, to come forward as the exponent of a truly scientific plan of coping with the disease, far in advance of the rough-and-ready one of inoculation.

"From time immemorial cows have been subject to a disease known as *cow-pox,* which shows itself on the teats and udder, in pustules closely resembling those of small-pox. The disease is very contagious, too, among cattle, and in those days it often assumed the character of an epidemic.

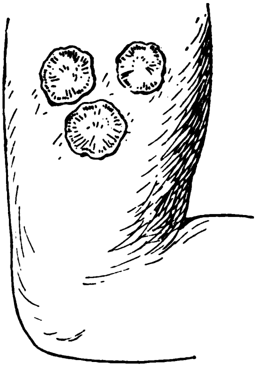
"It came to Dr. Jenner's ears that the dairy folk, if they happened to have a scratch on the hand, were very liable to contract this disease themselves, from the matter pressed out of these *pocks* or *pustules* during the process of milking; but that the disease so contracted showed itself only by similar pocks on the hand, at those spots where the poison matter had entered, and did not affect the health of the person; and further, that *those who had taken this cow-pox were always proof against any after-attack of small-pox.*

"This set the man of science thinking, and he commenced a long and patient series of experiments. *He began* by inoculating a child with matter taken *from the* pock of a diseased cow, and the result of this oculation was a large round pock on the child's skin, hich in course of time died away, without affecting e general health.

"Before the pock died away, however, he took from matter enough to inoculate second child, and from this ıe he similarly inoculated a ıird, and so on again and again.

"Some months later he eliberately inserted into the in of the last child so treated e actual virus of small-pox, ıd *found that the child was oof against the disease.*

"Science, however, never mps at conclusions; it arrives the truth by long and patient search. This explains why Dr. Jenner continued s experiments and observations for nearly thirty ars, before he published them to the world.



"He called his discovery *vaccination,* because the atter with which he inoculated his subjects came iginally from the cow, and the Latin name for a cow *vacca;* but he proved by his experiments that it was ot necessary to go back to the cow each time for fresh *ccine* matter.

"When this wonderful discovery became known, edical men in every civilised nation in the world bmitted it to the most searching tests, and the result their investigations was an unanimous declaration at *with this weapon in their hands, and legal power to e it, they would be able to stamp out small-pox from face of the earth.*

"They could not say, any more than it can be said nowadays, that vaccination affords absolute protection against small-pox, because it is found that, here and there, a vaccinated person does contract it. But one thing was then, and still is certain, and that is that wherever a vaccinated person takes small-pox, the disease is so mild that there is practically very little risk of death or disfigurement.

"The fact is vaccination protects against small-pox, because the poison matter inserted into the body during the process has already been deprived of its virulence and malignity, by previously passing through the body of the cow.

"Such convincing proofs of the efficacy of vaccination could not be set aside, and in 1854 an Act of Parliament was passed, compelling all parents to have their children vaccinated within three months after birth. This is the law of the land to-day, although some people foolishly try to evade it, in spite of the fact that it has been one of the greatest blessings ever conferred upon mankind."

PART VI.—MANAGEMENT OF THE SICK-ROOM

Lesson XLVIII

THE SICK-ROOM

"What a very pleasant and profitable evening we *have spent*," said the girls one to another, as they *wended their* way homeward. They had just said

Good-bye" to Miss Brown at her gate, and there she tood watching them, till they disappeared one by one ound the bend of the road.

It was really a sight worth seeing to watch the kind genial teacher in the midst of her girls, and note the close bond of attachment that existed between them; but then she had such a happy knack of doing everything. She had invited them to spend the evening with her, because she wished to follow up the doctor's lectures with some practical hints of her own about the management of the sick-room; but strange to say for the last two hours they had all been heartily enjoying themselves—she as much as any of them—with parlour games of various sorts, and her last words at the gate were, "Don't forget our arrangements for the next meeting, girls." As if they were at all likely to forget.

However, we have nothing to do with their merry-making just now. Let us rather peep in upon them as they sat round the room in the earlier part of the evening chatting over their all-important subject.

After explaining the object of their meeting, and calling upon the girls to get their note-books and pencils ready, she said, "I cannot impress upon you oo strongly the high importance of good nursing in every case of illness, for to speak plainly more depends upon the nurse than upon the doctor—a careless nurse may easily undo all the doctor's work.

"Suppose we begin by glancing at the sick-room self. Of course it is not always possible to choose our room, but wherever it is, the choice should fall pon a *large, light,* airy apartment, *on the sunny side* *the house.* Every sick-room should have a fire-

place, not merely for the purpose of warmth, but al
for ventilation. It should also have a large pleasa
window to admit the genial sunshine, and both sash
should open, when required, to cleanse the air of t
room."

"Some people always keep the sick-room darkene
with the blinds," said Norah.

"Yes, Norah," replied Miss Brown, "that is the old-fashioned notion, but, like a good many more *old-fashioned* notions, it is an exploded one. You have only to remember what the doctor told us about the influence of sunshine on our lives, and you will at once see the reason for it. If sunshine is essential in health, how much more essential must it be in sickness. Darkness brings gloom and depression, and the sick person should certainly be led to look upon the bright side of things as far as possible.

"The one thing necessary is to so arrange the bed that the direct rays of the sun cannot fall upon the patient's face. This can be accomplished much more satisfactorily by means of a screen of some sort if necessary, than by shutting out the sun entirely.

"The cleaning of the sick-room is an important matter; it should be attended to regularly every day, and with as little fuss as possible, so that the patient may not be disturbed.

"Dust must not be allowed to accumulate anywhere, but everything in the room should be kept bright and tidy. The dusting should be done with a slightly damp cloth, so as to avoid scattering the dust about.

"*On no* account should slop-water, or any other *offensive* matter, not even the soiled body-linen, be lowed to remain in the room. It is because of the relessness of some nurses in this respect, that I ways discountenance valances to the bed. It is so sy to slip things under the bed, and with the valance hide them up, it often means '*out of sight out of ind*,' and there they remain. I have frequently seen o the wash-stand and the table littered up with an cumulation of bottles, cups, glasses and other things, hich would have been much better out of the sick-om altogether.

"Side by side with the necessity of keeping the om and the articles in it clean, stands the equally ramount necessity of keeping the air clean, which e patient has to breathe. A fire is the best ventitor for the bedroom, because, as you know, it sets up constant stream of air towards the chimney. It is the utmost importance, however, that only the best d purest air should be allowed to enter. Hence it better to admit fresh air at the windows, than at the or of the sick-room, as it then comes direct from the en, and not through the rest of the house.

"Draughts must of course be avoided, and the best ay of doing this is by drawing down the top sash of e windows about half an inch. If the bed cannot so arranged as to avoid the direct current, a screen provised with the aid of a clothes-horse and some eets or blankets, can be easily put up between it and e window, and then all will be safe. A narrow ntilating window-board, such as the doctor described his lectures on ventilation, will also provide fresh r without the danger of a draught. On no account ust the room ever be allowed to get faint and *uffy.*"

"I went to visit a sick friend the other day," said Mary Jones, "and when I entered the room there was a strong smell of Eau de Cologne. I suppose they must have sprinkled the perfume about to hide the faint smell, for I am sure the air of the room was very stuffy."

"Yes, Mary, I have no doubt you are right," replied Miss Brown. "The practice of burning pastilles, and sprinkling perfumes on the bed, is very common among those people, who seem to have a wholesome dread of fresh air. They don't like the faint smell of the close room, so they hide it up rather than drive it out. But they little know how they retard the recovery of the patient by depriving him of fresh wholesome air.

"The temperature of the room is an important matter. From 60° to 65° is a healthy temperature, and under no circumstances should it ever be allowed to exceed 70°. The need of a fire for ventilating the room sometimes makes this a little difficult, but a mere handful of fire is sufficient for the purpose in warm weather.

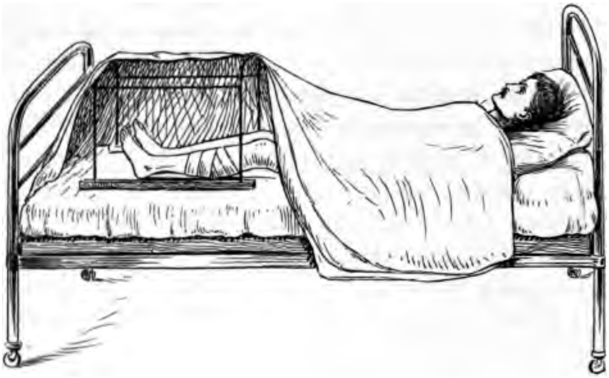
"Next as regards the furniture of the sick-room, let me begin by saying that carpets and thick woollen curtains are altogether out of place. If any carpet at all is allowed in the room, it should be merely a strip or two by the sides of the bed, for they can be easily taken up and shaken.

"The most important article of furniture in the room of course is the bed. A feather bed should never be used in the sick-room, especially for a long illness, as it is liable to get lumpy and uncomfortable, and then the patient will probably suffer from bed-sores. An iron bedstead with a spring mattress, and a horse-hair or wool mattress above that, is at once the cleanest, healthiest, and most comfortable bed for all cases of sickness.

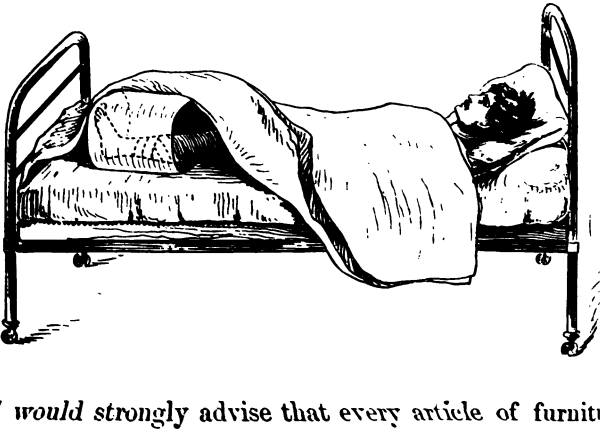
"The bed-clothes should be light as well as warm; thick heavy counterpanes are always very distressing to the patient. This is especially so in the case of injuries—indeed it is often advisable, and sometimes imperative, to have a *bed-cradle* for the express purpose of keeping the weight of the clothes off the injured limb.

"A narrow bedstead is better than a full-sized one, for it enables the nurse to reach across from either side; and if possible it should stand out a little from the wall, for then she will be able to get round the head if she wishes to raise the patient into a sitting *posture.*

“ In cases of weakness it is often a great relief the poor sufferer to be raised in this way for a lit while, and a rough-and-ready *bed-rest* can be eas arranged by means of a chair, and a couple of pillo



“ The less furniture in a sick-room the better, a *I would strongly* advise that every article of furnit *not absolutely* necessary be removed, for such th



simply occupy air-space in the room, and we want as much air as possible.

"And now," she added with a smile, "I think we have had enough work; suppose we finish up the evening with some fun."

Lesson XLIX

THE SICK-NURSE

A week went by, and the girls might have been seen in little groups of three or four on their way to spend another pleasant evening with their good friend and teacher, Miss Brown. Of course she was on the look-out for them, and when they arrived, she said, "I *have arranged* for a musical evening, girls, as soon as

our more important subject has been properly discusse
so we will lose no time in beginning.

"Our last chat was about the sick-room; now
want to lead you to think about the nurse herself, a
her qualifications for the important work she has to

do. If you follow me carefully I think you will find the subject both interesting and profitable.

"The first and most essential qualification I can think of for a nurse is tender-hearted sympathy with suffering. If she enters upon her sick-room duties, actuated by this true womanly instinct, she cannot fail to be self-sacrificing, patient, and forbearing in all her dealings with her sick charge.

"No doubt you have often seen poor mother sorely tried with the fractious, wayward whims of a sick child, and how do you think she would manage to keep cheerful, good-tempered, and smiling, if it were not for the loving heart that beats in sympathy with the little sufferer? It is well to remember too that, on a bed of sickness, old and young are very much alike. Grown-up people are often every bit as fractious and whimsical then as a little child, and the nurse's task is not an easy one, for she must at all times be cheerful, good-tempered, gentle, and smiling.

"The nurse, in fact, with her bright, happy, cheerful disposition, should be a ray of sunshine and hope to her patients. She should truly be a sort of '*ministering angel*' to lead the sick and suffering ones back to health and happiness. They, in their helplessness, look to her for everything, and she on her part ought to be regardless of the trouble it gives her, provided she can do them good."

"You remind me of my own illness last year, Miss Brown," said Norah, "when mother nursed my little brother and me through the fever. I suppose we must have been very ill, but I well remember it was almost pleasant to be lying there, for mother was just the kind gentle nurse you describe. Nothing was too much trouble for her."

"Yes, Norah," replied Miss Brown, "that is always the characteristic of a good nurse. She attends to all the wants of her patients in a pleasant, gentle way, and she does it all without the least unnecessary fuss or noise, but in a quiet subdued manner, which is sure to have a soothing effect on them.

"*Quietness* in the sick-room is very essential, for sick people are always more or less irritable, and noise of any kind is sure to worry and disturb them. For this reason it is advisable, wherever it can be arranged, to choose a room as far removed from the noisy street as possible, so that the sick person may not be disturbed by the rumbling of wheels and the usual street cries. For the same reason gossiping and chattering are out of place in the sick-room. The nurse herself must not be a perpetual gossip, and even when she does enter into conversation for a little while with her patient, it should always be on some subject, which will tend to divert his mind from his own sufferings and surroundings.

"While speaking of quiet, let me give you a word of advice as to the admission of visitors to the sick-room, for much harm is often done to the patient by thoughtlessness in this matter. It is generally when the patient is beginning to mend, after some serious illness, that well-meaning, but perhaps undesirable visitors call, and then the nurse must exercise her own judgment in admitting or excluding them, for she after all is mistress of the situation, and the doctor will be sure to blame her if he finds a change for the worse when he next visits his patient.

"Garrulous, loud-talking people should be courteously excluded from the sick-room altogether, or weariness, headache, and perhaps a relapse may follow. On the other hand, a visit from a quiet sympathetic friend, with a bright pleasant face, and a few cheery words, will often act like a ray of sunshine on the sick one, who is struggling towards convalescence, and do him much good.

"Of course these remarks do not refer to infectious iseases, for no visitors of any kind should be allowed the sick-room in such cases of illness.

"Whispering is as objectionable as loud talking, for ck people are naturally suspicious; they are sure to

ink the whispered conversation refers to them, and ill most likely begin to suspect that some change for e worse has taken place, and worry themselves accordgly. Even should any unfavourable symptom show self it should always be discussed outside the room, *d not in the* presence of the patient.

"Soft slippers are more suitable than boots or shoes, which would worry the patient by their creaking; but it is not at all advisable for the nurse to creep about the room on tip-toe. It will be quite sufficient if she walks to and fro in a natural way, but quietly.

"Soft cotton fabrics are the best material for the nurse's dress, for they do not rustle and make a disturbing noise at every movement as some other materials do. They have the additional advantage, moreover, o being easily washed, and this is an important matter because the nurse should always be clean, neat, an prim in her own person.

"This consideration leads us to notice anothe essential qualification, which is that she must b scrupulously clean and tidy not only in herself, but als in the room, the bed, and the patient. A good nurs takes a pride in keeping the sick-room a model o neatness, order, and method. She not only has ' *place for everything,'* but she is so methodical in he ways that '*everything is in its place*' when it i wanted.

"Perhaps in nothing, however, is cleanliness s essential as it is in the patient's food. The nurse ma be (and of course ought to be) an excellent cook, abl to prepare nourishing and suitable dishes for the sic room. But unless she is daintily clean in her cooker and in the vessels on which the food is served, s will most likely have all her work of preparation t no purpose, for the delicate stomach of the invali will revolt against whatever she prepares.

"There is one very essential point which eve nurse should clearly understand, but which I am afr ıetimes lost sight of altogether. She should remember that important as she is in the om, she is not supreme. She is under the of the doctor, and in every particular it is her 'or the good of her patient, to note carefully all

tructions, and to strictly and intelligently carry ıut to the letter.

[uch harm is sometimes done when the nurse, er limited knowledge, presumes to form a judg- ıf her own, and act upon it against the instruc- ıf *the doctor*. This I may say happens more frequently with the patient's diet, than with any other part of the treatment. The doctor orders a special diet, which is to be strictly adhered to in every respect; but the sick person has strange cravings perhaps for food of a totally different character. Should the nurse be weak enough to yield to her patient in this respect, and argue with herself that it cannot do him any harm as he craves so much for it, she will almost certainly undo all the good the doctor has done; and this very fact leads me to notice another essential qualification in the nurse, which I had lost sight of till now. It is that, with all her kindness and gentleness, she must be firm in dealing with her patient—firm enough to refuse to do anything against the doctor's orders.

"Now in conclusion let me say a word or two about the nurse's own health, for this is a matter she must not neglect in the midst of her many duties, or she herself may break down, just when her patient needs her most. It must be remembered that, confined as she is to the sick-room, the want of fresh air and out-door exercise would soon begin to tell upon her health, and one of the first results of this close confinement would probably be loss of spirits and nerve power.

"Instead of being cool and self-reliant under any emergency—another most essential qualification—very little would suffice to rob her of her presence of mind, and throw her into nervous agitation, and I need not remind you that a nervous nurse is altogether out of place in the sick-room.

"To counteract the depressing influence of her surroundings therefore she should always arrange for a

sk walk, or some sort of exercise in the open air
ce every day. The change of scene will invigorate
r over-taxed faculties, and send her back to her
tient fresh, bright, and cheerful once more.

"She will also find much benefit in the same
ection from a daily bath, and a frequent change of
der-linen.

"Night is usually the worst time with the patient,
d it is essential that the nurse should seize her
portunity for a few hours' quiet sleep some time
ring the day, for there is no surer cause of break-
wn than long-continued watching and loss of sleep.

"Lastly, for the patient's sake as well as her own,
e nurse should never take her meals in the sick-room,
t in some other room outside. The smell of the food
the room would most likely be very distressing to
e patient, and she herself would have less appetite
it than she would in another room."

"And now," added Miss Brown, as she rose from
r chair, "we have finished work for this evening; let
change *nursing* for *music*."

Lesson L

Duties of the Sick-Nurse

"We have already discussed the personal qualifica-
ns which are necessary to make a good sick-nurse,"
gan Miss Brown, when she next met her young
nds. "Let us now glance at a few of the duties
ich fall to her lot in the sick-room, and more
ecially those connected with her actual attendance

on the patient, for they after all constitute her chief occupation.

"In our last conversation I insisted upon the necessity of keeping the room, the bed, and the patient clean and wholesome. Regularly every morning and evening she should wash the patient's face and hands, and brush and arrange her hair neatly, for this will have a soothing and refreshing effect upon her. Sometimes, however, the poor sufferer is really too ill to be able to bear much handling, but a good nurse, with tender sympathy of voice and deft gentleness of touch, will accomplish the task even then without distressing the patient.

"A change of bed-clothing at these times is also very refreshing to the patient. There should always be two sets of garments, one for the night and one for the day. Those worn during the night should be removed in the morning, and sent away to another room to air in readiness for the next night, and fresh day garments should be put on in their place; and the nurse should make it her special duty to warm as well as air the fresh garments, before putting them on the patient.

"If the patient is able to bear the fatigue, the doctor frequently orders the whole body to be sponged with warm soapy water once a week, for the soothing effect of this will often induce sleep, where other things fail to do so. A large sponge should be used, and it must be well wrung out of the water, to prevent it from dripping upon the bed and the bed-clothes. Only part of the body should be sponged at a time, and this should be well dried with the towel, and covered up with clothing, before the next part is tripped. The sponging should be done under the ed-clothes and as quickly as possible to avoid a chill, nd the bed itself should be protected, while it is being one, with a sheet of rubber waterproof pushed under he patient.

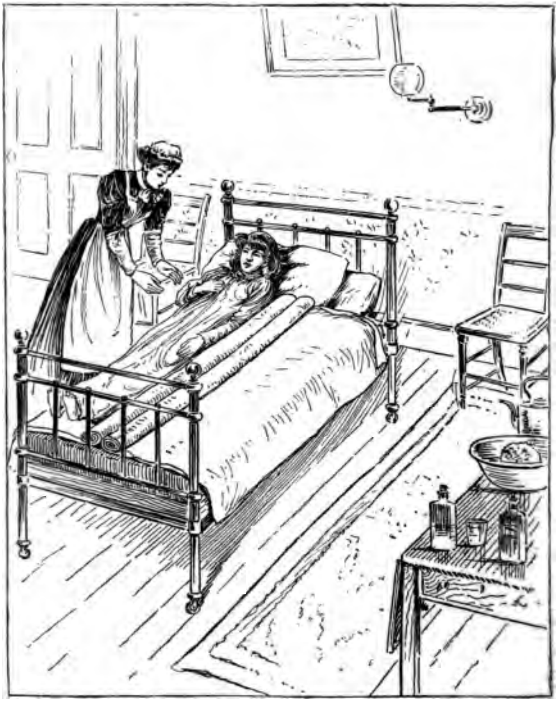
"This affords a good opportunity for a complete hange of the body linen, which I need scarcely remind ou requires to be frequently changed, as it becomes ontaminated with the perspiration and other foul atters from the skin.

"A change of bed linen from time to time is as ecessary as a change of garments, for the sheets, as ell as the body linen, soak up perspiration from the atient's body. In cases of serious illness, where the atient cannot be moved from the bed, this work of hanging the bed linen calls for very careful manage-ent.

"The clean fresh sheets should in every case be ung on a clothes-horse round the fire, *in some other oom,* so that they may be well-aired and warmed, efore they are put upon the sick-bed. The under heet naturally presents more difficulty than the upper. et me explain how to manage with this one first.

"The soiled sheet is rolled up lengthwise from one ide of the bed, till the roll touches the patient's body; hen the clean one, aired and warmed, is rolled up in a imilar way, and laid in its place, so that the two rolls ie side by side. The nurse then raises the patient ently, and places her on the clean sheet, after which he soiled one is easily drawn away, and the remaining alf of the clean one is unrolled and neatly arranged.

"A simple method of changing the top sheet is to *oll up the clean* one crosswise, lay the roll across the foot of the bed, lift the bed-clothes at the foot, pla the roll in position under the soiled sheet, and th carefully move it up the bed, unrolling it as it g When this has been done, nothing remains but to ca



fully draw away the soiled sheet towards the foot, and arrange all neatly.

"Of course, where the patient is able to be moved, and can sit up while the bed is changed, there is very *little difficulty.* The only care then is to see that a *blanket or* some other good wrap is at hand to avoid a ill, and to provide a rest of some kind for the feet, they must not be allowed either to hang or to ıch the floor while the patient sits up.

"But the nurse has other duties besides that of ›ping the patient clean and wholesome. She should be every sense the doctor's second self. He prescribes tain regular intervals for administering medicine l nourishment to the patient, but although everyng depends upon the regularity with which this is ıe, it is impossible for him to personally attend to business himself; and it is therefore the duty of nurse, as his trustworthy assistant, to carry out his ers implicitly in this respect. I might add for the dance of young nurses, however, that it is always y unwise to rouse the patient from sleep for this rpose, because a calm peaceful sleep often does more restore the system than either food or physic.

"I cannot pass on without giving you a word of ious advice and warning with regard to the medicines in the sick-room. A good nurse is too orderly and methodical in her arrangements to allow medicines and lotions to stand side by side. She has a place for each, because she knows that lotions (which are intended for outward application only) contain poison as a rule, and she has probably heard of sad, fatal mishaps which have at ıes occurred through the carelessness of the nurse *mistaking* one bottle for another. There is less

danger of this than formerly, because poisonous lotions are now usually supplied in dark blue fluted bottles, so that there is no difficulty in distinguishing them. Even in the dead of night if it were too dark to tell by the colour, the peculiar make of the bottle is sufficient to prevent mistakes. Still, never neglect my warning, but be sure to keep medicines and lotions always separate.

"I said just now the nurse ought to be the doctor's trustworthy assistant—his second self. In this capacity it is her duty to carefully observe the patient, and to note, without appearing to do so, any changes that take place, so that she may be prepared to furnish the doctor with a true and faithful report at his next visit.

"She cannot be expected to do this properly if she trusts to her memory alone; hence it is an excellent plan to make a written record, there and then of everything that occurs. This enables her to give the doctor exact particulars on many points, which it is important for him to know, in order that he may judge what progress the patient is making. It gives him in fact a complete history of the patient from one visit to the next."

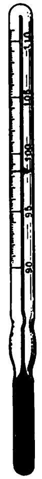
Lesson LI

FURTHER DUTIES OF THE NURSE

"In many cases of illness," continued Miss Brown, "the temperature of the patient's body is the one *important* matter, on which the doctor requires constant *and accurate* information; and every nurse therefore should know how to take her patient's temperature from time to time, as the doctor cannot be always present to do it himself.

"For this purpose a special kind of thermometer, known as a *clinical thermometer*, is used. It is a small glass instrument about four inches in length, and is graduated only from 90° to 110° Fahrenheit. The bore of the tube itself is very fine, and in it there is a small thread of mercury quite separate from that in the bulb. This makes the instrument a self-registering one, for when once the thread of mercury has risen in the tube, nothing but a smart shake will force it down again, so that there is plenty of time to read it accurately.

"I have here the instrument itself; let me show you how it is to be used. I will first give it a slight shake to force the index down, and then I will place the bulb or lower part of the instrument in Mary's mouth, just under her tongue. If you watch it for three or four minutes, you will see the little thread of mercury gradually rise.



"In the sick-room, especially with a child, the nurse often finds it more convenient to place the instrument under the armpit, as it is not an easy matter to keep the child's mouth shut, and if it cries it must draw in some of the cooler air of the room. If it is placed in the armpit, it is necessary to fold the arm well over it, so as to keep the bulb in actual contact with the flesh for fully ten minutes, but even then it is not quite so satisfactory as it would be *in the mouth*."

After a few minutes Miss Brown removed t instrument from the girl's mouth, and handed it rou for all to read. The index stood at a point a lit over 98° Fahrenheit.

"One does not require to look twice at Mary," continued, "to see that she is in good health, and th thermometer stands at 98·4° *Fahrenheit,* because thi is *the normal or natural temperature* of the healthy body.

"If it varies even one degree above or below this point it is a sure sign that everything is not as it should be. At 100° it shows that the body is *feverish;* at 102° it marks *actual fever,* at 104° *high fever;* and at 105° *extreme fever and extreme danger.* Similarly, a fall below the normal temperature indicates a low vitality, which can only end in complete collapse, if it is allowed to continue. Thus the thermometer is a sure guide as to the condition of the patient; it is to the doctor what the beacon light is to the sailor at sea, for it gives timely notice of danger ahead.

"Now let us pass on to consider another very important duty of the sick nurse. Inflammation is one of the doctor's chief causes of anxiety, for it is at all times a most dangerous symptom. Wherever it exists it must be allayed and kept under, and he relies to a very large extent upon *poultices* and *hot fomentations,* as his most powerful aids in doing this.

"He does not himself, however, prepare and apply these things; he merely prescribes them, and it becomes the duty of the nurse to see his orders strictly carried *out.* To do this intelligently she should clearly *understand* the purpose of these applications, and the *way in which* they work for the benefit of the patient.

"I have already had occasion to explain the nature of inflammation, and you no doubt remember that, in every case it is due, first of all to a congested or over-gorged condition of the blood-vessels in the parts affected, and afterwards to a leakage of the blood through the walls of those vessels into the tissues around.

"It is the object of poultices and fomentations *to get rid of this suffused blood* from the inflamed parts. The warmth from them stimulates the lymphatic vessels in their work of draining off the surplus blood, and passing it onward into the circulation again, and nothing but warmth will do it.

"When, therefore, the doctor orders hot poultices and fomentations, the nurse may be sure he does not mean her to apply them more cold than hot, for any half cold application of this kind, is not only useless but worse than useless—it does harm rather than good. Neither does he mean that the poultice is to be put on and left there till it is cold. It must be taken away before it gets cool, and another hot one put in its place.

"It should be a very simple matter to prepare a poultice, and yet, strange to tell, doctors speaking from experience say that they find comparatively few people who can do it entirely to their satisfaction. Let me now give you a few plain directions which you will no doubt find useful some time or other.

"Linseed meal is the material most commonly used for the purpose; we will therefore commence with that.

"A very common way is to put the linseed meal into a bowl, pour boiling water on it, stir it up till it is of the required consistency, and then spread it on a *cloth and apply it* where it is wanted. This, however, is not the most satisfactory way. It is much better t put the meal into a small saucepan with water, a n let it come to the boil, stirring it all the time as yo would stir porridge. When this has been done, i should be turned out, and spread rapidly with a sp oo over one half of a large piece of flannel, placed on a ho dish in readiness to receive it. The other half of the flannel should next be folded over the poultice and the

two edges basted together with a needle and thread. The poultice is now ready, but as it has to be carried to the sick-room from the kitchen (where it has probably been prepared), it should be covered up, dish and all, in flannel, so that it may lose none of its heat on the way.

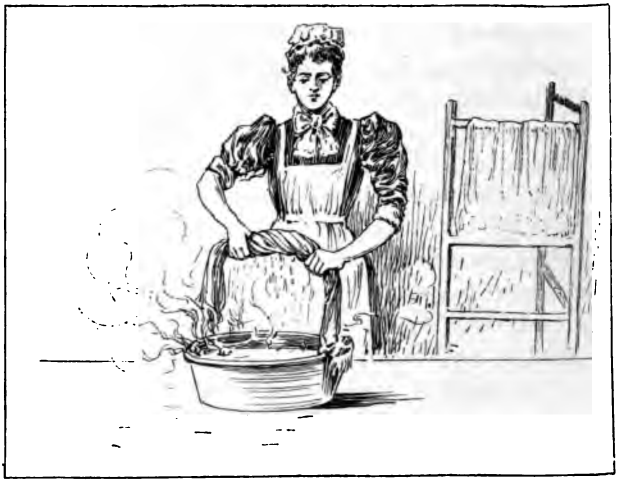
"This is the best plan for preparing a good hot *poultice, capable* of holding its heat for a long time, *d the nurse's* chief care before applying it must be to see that it is not too hot. She may easily test it by holding it to her own cheek. In applying it to the patient it must be covered with a piece of warm flannel, and then bound up close with a flannel binder. This will prevent the heat from escaping from the poultice too rapidly; but remember, it must not be left there till it is cold.

"In bad cases of inflammation it is often necessary to use mustard, mixed with the linseed meal—about one part of mustard to every three parts of the meal. The most effectual way of preparing a poultice of this kind is to first of all mix the mustard in cold water, then boil the linseed meal, as if for a simple poultice, and then after turning about half of it out on to the flannel, to pour the prepared mustard into the other half which is left in the pot. Nothing more is needed but to stir the mustard and linseed well together with a spoon, pour the mixture out on the top of that which has already been spread over the flannel, and close up the poultice with a needle and thread in the usual way. The layer of linseed and mustard mixed is the one to be placed next to the patient.

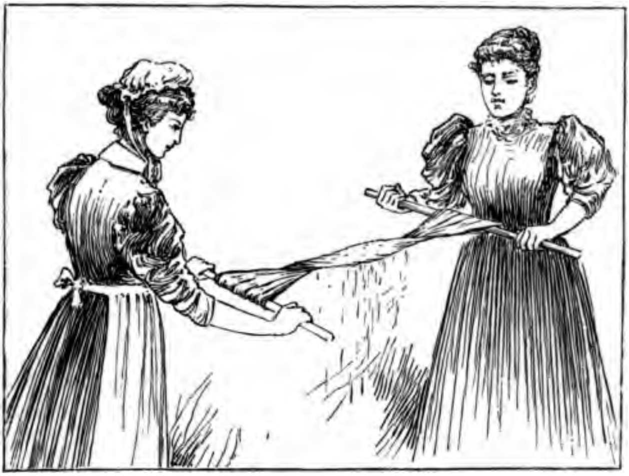
"Mustard is often of great service in the sick-room, although the home-made poultice itself is now gradually giving place to the prepared mustard plaster, or mustard leaf as it is called. The one thing to remember in making a mustard poultice is that *the mustard must always be mixed with cold water,* as hot or even tepid water robs it of much of its effect. The poultice should not be made too wet, and it should be spread on a piece of cambric or thin muslin. It is a good plan to smear a little vaseline over the place before *applying the* mustard, as this prevents the skin from sticking to the poultice, and perhaps tearing away with it.

"Bran, bread, and charcoal poultices are all useful in their way. The chief care in making them is to drain off as much of the water as possible, for a wet sloppy poultice, besides being uncomfortable, is likely to give the patient cold, by dripping through to the clothing.

"You should make a bran poultice in the same way as a linseed-meal poultice, but the bread and the charcoal poultices are prepared by pouring boiling water on the material. The charcoal poultice is made with crumbled bread, linseed meal, and powdered charcoal; it is useful in cleansing foul sores.



"In some cases a fomentation is more effective in allaying inflammation than a poultice. A good way of *preparing* a fomentation is to pour boiling water over *a large piece* of flannel, and when it is well soaked, lift it out of the hot water with a stick, and wring it as dry as possible in a towel. If the nurse has some one to assist her, the best way to wring the hot flannel is to throw it into a roller-towel, put a stick through each end of the towel, and twist it in opposite directions, each person taking a stick. If she has no help, she must be content to roll the flannel in a large bedroom towel, and wring it in the ordinary way. In either case when the water has been wrung out, the flannel, after being shaken, should be applied to the required part, and at once covered up close with other dry flannels to keep the heat in."



Lesson LII

FOOD AND DRINK FOR THE SICK-ROOM

"This evening will bring us to the end of our course, girls," said Miss Brown, "for I have only one other subject for discussion, and that is the preparation of food and drink for the sick-room.

"In every case of illness it is the doctor who prescribes the diet for the patient; indeed he is the only fit person to do it. He decides both as to the nature of the food, the amount to be given at a time, and the interval between one meal and the next; and of course it is the duty of the nurse to obey his orders implicitly.

"Now first as regards the nature of the food, she should remember that the very articles the doctor prescribes, because they are nourishing and easy of digestion, may be made indigestible and therefore utterly useless to her patient by bad careless cooking. You know, from your experience at the cookery classes, that this is true even in the preparation of food for people who are in robust health; and I need scarcely say that it applies with much greater force in the case of sick persons, for their digestive organs are weakened by the illness, so that they are unable to digest ordinary every-day food,—much less food rendered indigestible by bad cooking.

"The natural result of the illness is to make the patient weaker and weaker day by day, and the doctor depends less on his medicines, than upon the nourishment supplied, for keeping up the bodily strength. If therefore the food which is taken only gives the stomach unnecessary work, without supplying proper nourishment, the patient must inevitably sink lower and lower.

"I think I have said enough to show you how necessary it is for the sick-nurse to be a good cook; but before I pass on, let me say that nothing should ever be cooked in the sick-room, for the delicate stomach of the patient would certainly revolt against the smell of preparation, and turn against the food when it was offered.

"This leads me to notice the next point, which is that the food, besides being nourishing and easy of digestion, must be tasty and palatable, for remember, the patient in all probability has very little appetite, and it is the nurse's business to tempt him, by every means in her power, to take what she places before him.

"You must clearly understand however, that when I speak of tasty and palatable dishes, I have no idea of recommending strong flavourings or highly seasoned food. These things are objectionable at the best of times; they would be very hurtful, and even dangerous, in the sick-room.

"No, the simplest and plainest food is best for invalids, and the best and most appetising sauce for it is perfect cleanliness on the part of the cook. A careless cook who prepares the food in an imperfectly cleaned vessel, so that the least flavour of some other food is given to it, will have the mortification of seeing the sick person turn away from it in disgust, even *though in other* respects it may be the daintiest of dishes. Too much care therefore cannot be exercised in seeing that the vessels used for the sick-room cooking are kept scrupulously clean.

"Much depends too upon the manner in which the food is placed before the patient. If it is served on a tray, with a clean white cloth for covering, and the plate, knife, fork, spoon—everything also spotlessly clean, the sight of it will often tempt the poor creature to eat, even against his will. But if the very same food were offered to him without these pleasing appetisers, he would almost certainly turn away from it with loathing.

"When the patient has taken as much as he can, whatever remains should be at once carried away out of the room. The delicate stomach of the invalid could not bear the sight and smell of the food after he had finished eating. The very thought of food would be sure to fill him with loathing, and he would have no appetite to eat when he was next required to do so.

"A good nurse never asks her patient: 'What shall I give you?' or 'If I make you some beef-tea will you take it?' or 'Shall I bring you some food now?' She quietly prepares what she wishes him to take, and then brings it to him without the least fuss, and firmly but patiently persuades him to take it. A sick child is always more troublesome to manage in respect to its food than a grown-up person, but knowing how important it is to keep up the strength of the little invalid, she will generally, by coaxing and gentle persuasion, succeed in getting it to take some amount of nourishment, and then she proceeds on the principle of *little and often*.

"That principle of little and often must to a large extent be the guide even in dealing with grown-up persons, for they have neither appetite nor digestive power to enable them to take much food at one time.

"This brings us to the consideration of the recurring meals of the day, and I must strongly impress upon you the necessity of seeing that the food is regularly and punctually served to the patient in accordance with the doctor's directions.

"We have already seen how important regularity in feeding is even to those who are healthy and strong; but it is far more so in the case of sick people, for if they go beyond their regular meal-time all desire for food will pass away, and when it is at last set before them, they will in all probability turn from it with nausea and disgust.

"This, however, does not mean that the patient should be roused from sleep to take food, merely because the regular meal-time has arrived. It is much wiser (except in cases of extreme weakness, and under the express directions of the doctor) to let the sleeper sleep on, and give the food when he wakes naturally.

"I need scarcely say that *eating between meals* is as objectionable in the case of sick persons as it is with those who are in good health—nay even more so. The meal, such as it is, should be taken, and the stomach should be allowed fitting time not only to digest it, but to take its proper rest afterwards; and this could not be, if *eating of any sort between meals* were allowed.

"It must not be forgotten that the sick patient requires drink as well as food. Indeed, it is the *nature of* certain illnesses to give rise to unusual thirst, and then there must always be a beverage of some sort ready at hand to cool the parched lips and throat.

"It is very essential that none but suitable beverages be given to the patient, and among the best drinks for the sick-room are barley-water, lemonade, toast-water, and rice-water. Tea, coffee, and cocoa are stimulants, and therefore should be used sparingly. Especially is this the case with tea; even that which *is* given to the patient should never be strong. On the other hand, one small cup of tea occasionally will refresh and invigorate the patient much; but of course this does not refer to children, for they are better without tea or coffee altogether, even when they are well and strong.

"It is a curious thing that some people seem to have a sort of prejudice against the best of all drinks—water. A glass of cold water is often more refreshing to the sick patient than any other drink, and, provided it is not expressly forbidden by the doctor, it may be safely given. It would be well, however, to use only filtered water.

"The last piece of advice I have to give you is that you should be scrupulously clean in this, as in eve other detail of your sick-room management. Wh ever the beverage may be, see that it is kept in a cle vessel, and that the patient's glass or cup is wash and polished from time to time. Few things could more disgusting, even when one is quite well, than be forced to drink out of a dirty glass. Therefore, pi the poor, helpless, sick one, and do not cause him *turn away* in loathing from the drink he wants *badly.*"

"Now, girls," she said in conclusion, "we have finished. But before we separate I will hand to each of you a small card of simple recipes for the sick-room, which you will no doubt find useful hereafter."

RECIPES FOR SICK-ROOM COOKERY

The following points should be specially attended to in invalids' food :—

1. Every article used in cooking and serving must be perfectly clean.
2. Nothing should, if possible, be cooked within sight of the patient.
3. Food should be served punctually at the hour expected.
4. No more than is likely to be eaten should be offered at one time.
5. All uneaten food should at once be removed.

Ordinary Beef-Tea.—*Proportions:* 1 pint cold water to 1 lb. lean beef. Required for a small quantity, ¼ lb. beef ; 1 gill water.

Remove all skin and fat, cut the meat into very small pieces, put it into a jar, basin, or jug ; pour the cold water over it, stir, cover it tightly with a lid or with paper, let it stand half an hour. Place it (still covered) in a pan of boiling water (to come half-way up the jar). Boil this for one hour, then pour the beef-tea off. Remove any fat floating on it by passing small pieces of kitchen paper or blotting paper lightly over it. If not wanted immediately, let it cool, and warm as much as is wanted at a time, as beef-tea spoils when kept warm. The fat is easily removed when it is cold. If salt is permitted by the doctor, add it when the beef and water are set to stand for half an hour. A larger quantity of meat takes longer in proportion to cook.

Newly-killed beef is the best for beef-tea, as it contains more juice than beef that has been kept. After the beef-tea is made, do not throw the meat away ; although much of the strength is drawn out, some remains, and it may be used for various cheap dishes for which chopped meat is wanted, or may be added to the stock-pot.

Essence of Beef.—*Required:* ¼ lb. lean beef.

Remove all skin and fat; mince the meat very small; put it into a jar or jug, and cook as in last recipe, omitting the water. Essence of beef takes from four to seven or eight hours to make, according to the quantity of meat. If wanted weaker, add hot water to the liquor when it is to be used.

Raw Beef-Tea.—*Required:* 2 oz. lean beef; 1 gill water.

Remove all skin and fat, mince the meat very small, put it into a basin or jug, pour the cold water over it, and let it stand for half an hour; then strain off the liquid, and serve it. It should be made fresh each time it is wanted, as it soon becomes putrid. Raw beef-tea is sometimes given during teething, dysentery, and typhoid fever, but should not be given without a doctor's orders. Raw beef-tea should, if possible, be given in a covered cup, as the appearance is not attractive.

Veal or Mutton Tea.—Prepare in the same way as ordinary beef-tea, using one of those meats instead of beef.

Savoury Sago Soup.—*Required:* 1 oz. sago; 2 yolks of eggs; 1 pint beef-tea; 1 gill cream; 1 gill cold water.

Put the sago in a pan with the water; stew gently till tender; then add 1 pint of boiling beef-tea; cook together for a few minutes. Draw to the side of the fire; add 1 gill of cream. Beat the yolks well in a basin; pour in slowly the mixture from the pan, stirring with a wooden spoon to prevent the eggs curdling. Serve warm. *Nourishing.*

Savoury Custard.—*Required:* 2 yolks of eggs; 1 white of egg; 1 gill of beef-tea; ¼ oz. of butter; a small pinch of salt.

Whisk the yolks and white of egg well together in a basin; stir in the cold beef-tea. Butter slightly a cup or small jar; put the mixture in; cover with a slightly-buttered paper. Place this in a pan of boiling water, the water coming half-way up the jar. Steam thus for about twenty minutes, taking care not to shake the jar, which would curdle the egg. The water must be boiled slowly, to prevent the custard becoming honeycombed. Serve either hot or cold. *Nourishing.*

Mutton Broth.—*Required: 1 lb. neck of mutton (scrag end); 1 oz. whole rice;* 1 quart water; ¼ teaspoonful salt.

Remove all the fat from the meat; cut the meat into small pieces; wash the rice. Put the meat and salt into a pan, pour the cold water over them, bring slowly to the boil, skim carefully, and simmer for an hour. Then add the rice, bring to the boil, skim, and simmer for another hour. Remove the pieces of meat, and serve hot. Ground rice, flour, corn-flour, semolina, tapioca, or sago may be used instead of whole rice. The first three must be broken with cold water before being added to the broth, and need only be added a quarter of an hour before the broth is ready. Semolina may be strewed in, and cooked for a quarter of an hour. If tapioca or sago is used, it should be first soaked and then put into the pan at the same time as the meat and water, as they take long to cook.

Chicken or Veal Broth.—Prepare in the same way as mutton broth, using chicken or veal instead of mutton.

Ox Foot Jelly.—*Required:* 1 skinned ox foot; ¼ lb. loaf sugar; 2 lemons; 1 white and shell of egg; 2 quarts water; ½ inch cinnamon stick; 2 cloves.

Remove all the fat from the foot; wash well in water, cut in four pieces. Put the pieces in a pan, covering them with cold water; bring to the boil and throw away the water. Wash them again in cold water; put again into the pan with the two quarts of cold water, simmer slowly for five hours, skimming carefully. By this time it will be reduced to about one quart. Strain the liquid off into a bowl; let it become cold. When stiff remove all fat from the top. Then put this jelly into a pan with the cloves, cinnamon, sugar, juice of two lemons (keeping out the pips), and thinly-pared rind of one lemon, the white and shell of one egg (slightly beaten together), and stir continuously till it almost boils. Draw the pan to the side of the fire, and let it stand till a thick scum is formed, then strain through a clean cloth. Fill a basin or mould with cold water, let it stand ten minutes, pour away the water, and pour in the jelly. Let it stand until stiff. *Nourishing* if other foods are also taken, and *cooling.*

Calf's Foot Jelly.—Prepare it in the same way as ox foot jelly, using two calf's feet instead of one ox foot.

Milk and Suet.—*Required:* ½ oz. suet; 1 pint milk.

Chop the suet finely, tie it loosely in a piece of muslin, place it in the cold milk, bring slowly to the boil, and boil for about fifteen minutes. Then strain and serve tepid or warm, taking not more than a gill at a time. This preparation is *nourishing* and *fattening;* it is often given in consumption.

Arrowroot.—*Required:* ½ oz. arrowroot; ½ pint cold water; 1 teaspoonful sugar.

Add the cold water very slowly to the arrowroot, stirring all the time to keep it smooth. Put this and the sugar into a pan, stir till it boils and thickens; then boil for three minutes. Serve hot.

There is almost *no nourishment* in this preparation, but it is *easily digested*, and can sometimes be taken when nothing else is acceptable. When wine is ordered to be taken with arrowroot the above preparation should be used, and the wine well stirred in just before serving.

Arrowroot Milk.—*Required:* ½ oz. arrowroot; ½ pint milk; 1 teaspoonful sugar.

Prepare as in the last recipe, using milk instead of water. Stir constantly over a slow fire to prevent the milk from burning. *Nourishing* because of the milk.

Arrowroot Pudding.—*Required:* ½ oz. arrowroot; ½ pint milk; 1 egg; ¼ oz. butter; 1 teaspoonful sugar.

Prepare the arrowroot, milk and sugar as in the last recipe. Let it cool, stir in the well-beaten yolk of an egg. Pour the mixture into a buttered pie-dish. Whisk the white to a stiff froth on a dry plate; stir lightly into the pudding, and allow it to brown for ten minutes in the oven or before the fire. Serve hot. *Nourishing.*

Sago Milk.—*Required:* ½ oz. sago; ½ pint water; 1 teaspoonful sugar.

Steep the water and sago together for an hour, then put into a pan with the sugar. Bring gently to the boil, stirring constantly; simmer for about half an hour or till it is quite clear and soft. If thicker than desired add boiling water. Serve hot. Sago may be made with milk instead of water. *Nourishing* when made with milk.

Tapioca Milk.—*Required:* ½ oz. tapioca; ½ pint water or milk; 1 teaspoonful sugar.

Prepare in the same way as sago, simmering the tapioca for our, as it is not so easily made soft as sago. *Nourishing* n made with milk.

Rice Milk.—*Required:* ½ oz. whole rice; ½ pint milk; 1 spoonful sugar.

Wash the rice; put it with the milk and sugar into a pan, ing slowly to the boil, and simmer very slowly till the rice ecomes a pulp. Serve hot or cold. *Nourishing.*

Gruel.—*Required:* 1 oz. oatmeal; ½ pint cold water; ½ easpoonful sugar.

Put the oatmeal into a basin, pour over it the cold water, let it stand for twenty minutes. Pour off the water into a pan, pressing the oatmeal with a spoon, so as to leave it as dry as possible. Put the pan on the fire, stir it till it boils, then let it simmer slowly for ten minutes, taking care not to let it burn. Add the sugar and serve hot. ¼ oz. fresh butter may be stirred in before serving instead of sugar. If preferred, milk may be used instead of water; also ¼ teaspoonful of salt may be used. The oatmeal may be used up in a haggis, crappit-heads, etc. *Slightly nutritious;* produces perspiration.

Whey.—*Required:* 1 pint of milk; 1 teaspoonful of rennet.

Warm the milk to the heat of new milk, but do not let it become too hot; stir in the rennet, keep it warm for a few minutes till the whey appears and is clear. Pour into a basin, let it cool; break up the curd and strain off the whey. *Nourishing* and *cooling.*

Thick Milk.—*Required:* ½ pint milk; ½ oz. flour; ½ teaspoonful sugar.

Break the flour with a small quantity of cold milk; add the rest of the milk gradually, stirring to keep it smooth. Put it into a pan, bring slowly to the boil (still stirring) and boil for ten minutes. Serve hot. *Nourishing.*

Thick Milk, *another way.*—Tie some dry flour tightly in a cloth as if it were a pudding; put it into boiling water, and boil it for about four hours, when it will be quite hard. Open the ball, grate the flour, and proceed as in the last recipe. *Nourishing,* good in diarrhœa.

***Barley* Water.**—*Required:* 1 oz. pearl barley; 3 pints cold *water; ½ oz.* loaf sugar.

Put the barley into a pan with 1 pint of water, bring to the boil for ten minutes, strain off the water and throw it away. Put a quart of cold water into the pan with the barley, bring to the boil and boil slowly for about two hours; add the sugar, strain, and serve cold. If allowed, a few drops of lemon-juice are a pleasant addition, or a thinly cut piece of lemon rind boiled with the barley. The barley may be used for a barley pudding. *Slightly nourishing* and *cooling.*

Rice Water.—*Required:* ½ oz. whole rice; 1 pint cold water.

Wash the rice. Put it into a pan with 1 pint cold water; bring to the boil, boil for half an hour, strain and serve cold. If permitted by the doctor a teaspoonful of sugar may be added, and an inch of cinnamon cooked with it to give flavour. Good for diarrhœa, dysentery, and cholera. *Cooling* and *slightly nutritious.*

Bread Jelly.—*Required:* a penny loaf (stale); 1 quart water; 2 teaspoonfuls sugar.

Cut the crumb into thin slices, toast on both sides to a light brown. Put into a pan with the sugar and cold water. Simmer slowly till it becomes a jelly; strain while hot; serve hot alone, or mix with beef-tea, soup, tea, or coffee. *Nourishing.*

Toast Water.—*Required:* 1 slice bread; 1 pint boiling water.

Toast the bread on both sides till dried through and quite brown but not burnt. Put it into a basin or jug, pour over it the boiling water, let it stand till cold. Strain. *Cooling.*

Lemonade.—*Required:* 1 lemon; ½ pint boiling water.

Roll the lemon on the table to soften it. Pare the rind very thin; cut the lemon in two, squeeze the juice into a jug, keeping back the pips, as they are bitter. Add half of the lemon rind and the boiling water; cover the jug, let it stand till cold. Strain and use. If allowed, one ounce sugar may be added. *Cooling.*

Orangeade.—*Required:* 1 sweet orange; ½ pint boiling water.

Prepare as in the last recipe. *Cooling.*

Apple Water.—*Required:* 3 apples; ½ oz. sugar; a piece of lemon rind; 1 pint boiling water.

Wipe the apples with a damp cloth, neither pare nor core them ; cut them in slices and put them into a jug with the sugar and lemon rind. Pour the boiling water over them, cover the jug and let it stand till cold. Strain off the liquid. *Cooling.* Useful in fevers.

Egg Drink.—*Required :* 1 yolk of fresh egg ; 1 teaspoonful pounded sugar ; 2 tablespoonfuls warm milk ; ½ pint soda water.

Break the egg, separate the yolk from the white. Work the yolk and sugar together with a wooden spoon for about ten minutes, when they will form a creamy mixture. Add the warm milk ; stir till smooth ; pour into a tumbler and fill it with the soda water. *Very nourishing.*

If wine is ordered add it cold instead of the milk.

Egg with Tea, Coffee, Cocoa, or Milk.—Break the egg into a tea cup ; beat with a fork till well mixed. Pour in the hot tea, coffee, cocoa, or milk gradually, stirring all the time. *Very nourishing.*

If the invalid has very weak digestion, the yolk alone should be used.

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